

Biology Paper 1 Examiners' Projection 70 Papers

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PROJECTION NO. 01

Name..... Index No...../.....

School..... Candidates Signature.....

Date

231/1

BIOLOGY

THEORY

Paper 1

2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number in the spaces provided above.

Sign and write date of examination in the spaces provided above.

Answer **ALL** questions in the spaces provided.

All workings **MUST** be clearly shown where necessary.

For Examiners use only.

Question	Maximum Score	Candidates Score
1–24	80	

(a) State **two** structural adaptations that make xylem vessels suitable for transport of water and mineral salts.

(2mks)

.....

.....

.....

List any **three** adaptations of the root hair cells to their functions

(3mks)

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.....

2. (a) Why would you give an athlete glucose and not sucrose after a race? (1mk)

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.....

What happens to lactic acid after oxygen debt recovery? (2mks)

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3. (a) What is gene mutation (1mk)

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(b) State **two** disorders in human beings caused by gene mutations (2mks)

.....

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.....

What name is given to the factors in the environment that encourage or speed up mutation?

(1mk)

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.....

State the role of the following elements to the growth and development of plants (3mks)

Calcium

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Magnesium

.....

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Nitrogen

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.....

5. State **three** environmental factor that affect the rate of stomatal transpiration (3mks)

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6. (a) What is the function of the following parts of the male reproductive system (3mks)

Epididymis:-

.....

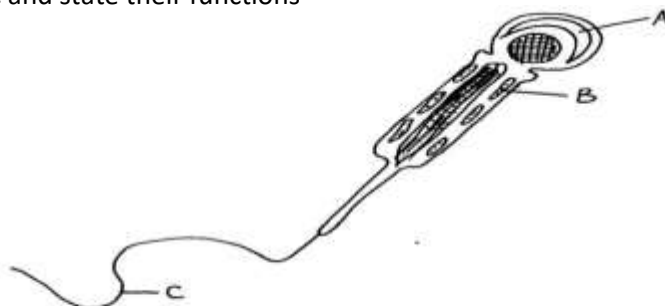
Seminal vesicle:-

.....

Interstitial cells:-

.....

The diagram bellow shows the structure of a sperm cell. Identify the parts labeled A, B and C and state their functions (6mks)



PART	IDENTITY	FUNCTION
A		
B		
C		

(a) Define the following terms:-
(2mks)

Species:

.....
.....

Binomial nomenclature:-

.....
.....

A certain sea animal has a smooth skin, lungs, regulates its body temperature and gives birth to young ones. The animal belong to the class.....(1mk)

8. For a leaf to be efficient for photosynthesis it has to be broad and flat. Explain (2mks)

.....
.....
.....

(a) In an accident, a victim suffered brain injury. Consequently the heart beat was affected.

Name the part of the brain which was injured (1mk)

.....
.....

State **two** differences that may be observed between a normal male and one who is incapable of producing testosterone.

(2mks)

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.....

10. Differentiate between convergent evolution and divergent evolution (2mks)

Convergent

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.....

Divergent

.....
.....

- (a) State **two** physiological changes that take place in a human skin in order to facilitate heat loss from the body.

(2mks)

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.....
.....

State **two** functions of sebum

(2mks)

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.....
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.....

- (a) Define the term Homeostasis (1mk)

.....
.....

State **one** way by which mammalian blood carry out homeostasis function
(1mk)

.....

.....

Differentiate between nervous and endocrine communication in animals
(3mks)

Nervous communication	Endocrine communication
(i)	
(ii)	
(iii)	

13. (a) Name the cartilage found between the bones of the vertebral column (1mk)

.....

.....

(b) State the function of the cartilage named in (a) above (1mk)

.....

.....

State the functions of the following organelles:

Lysosomes:-

(2mks)

.....

.....

Golgi apparatus:-

.....

.....

15. What is parthenocarpy? (1mk)

.....

.....

State **three** reasons why geneticists prefer to use **drosophila melanogaster** (fruitfly) for genetic experiments.

(3mks)

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17. What is the significance of active transport in the human body. (3mks)

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In an attempt to clear a certain weed from St. Thomas Moore fish pond, Riang'ombe Sec. School Biology students introduced a species of beetles into the pond.

(a) Give the term used for this method of control (1mk)

.....
.....

(b) State **two** advantages of this method over the use of herbicides (2mks)

.....
.....

(a) State the causative agent of cholera (1mk)

.....
.....

What is the cause of dehydration in cholera victims
(1mk)

.....
.....

(a) The numbers of chromosomes in a Gorilla cheek cell is 48. State the number of chromosomes in a Gorilla's ovum.
(1mk)

.....
.....

- (b) Give the role of each of the following during cell division (2mks)

Centrides:-

.....

.....

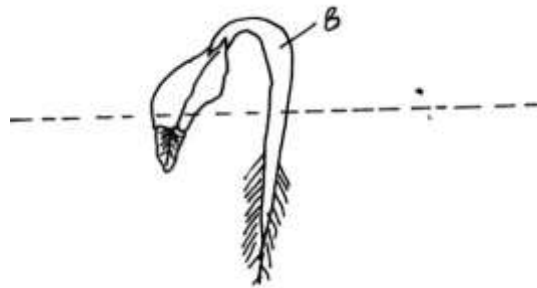
Spindle fibres:-

.....

.....

.....

The diagram below shows a germinating seedling



- (a) Name the part of the seedling labeled B (1mk)

.....

.....

- (b) State the type of germination exhibited above (1mk)

.....

.....

(a) Name **two** hormones that control metamorphosis in insects (2mks)

.....

.....

.....

Identify the plant hormone responsible for

(i) Callus tissue formation (1mk)

.....

.....

Formation of abscission layer

(1mk)

.....

.....

(iii) Fruit ripening (1mk)

.....

.....

(a) Name **three** ways by which flowering plants eliminate waste products from their body

(3mks)

.....

.....

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.....

.....
.....
(b) What is the importance of the following excretory products from plants (3mks)

Papain:-

.....
.....

Nicotine:-

.....
.....

Quinine:-

.....
.....

24. State **three** types of skeletons found in animals (3mks)

.....
.....
.....
.....

PROJECTION NO. 02

231/1

BIOLOGY

PAPER 1

THEORY

HOURS

State how each of the following parts of the mammalian ear are adapted to their function.

a) Cochlea (2mks)

Pinna (2mks)

2. **Give two** ways in which endotherms lose heat to the external environment. (2mks)

3. **What** is natural selection? (3mks)

4. **State three** evidences that support the theory of organic evolution. (3mks)

The table below shows description of sizes of glomeruli and renal tubules of two animals, which are living in different environments.

	Animal x	Animal y
Glomeruli	Large and few	Small and many
Renal tubules	Short	Long

a) **Name** the likely environment in which each animal lives. (2mks)

.....

.....

b) **Suggest** the main nitrogenous waste produced by animal Y (1mk)

6. A cell was found to have the following under a light microscope.

Cell membrane, irregular in shape and very small vacuoles.

Identify the type of cell above.

(1mk)

7. (a) **State** what would happen to a cell if its nucleus was removed. (1mk)

Reason

.....
.....

(b) **Give** the function of nucleolus. (1mk)

8. (a) **Name** the products of the light reaction stage. (2mks)

(b) **State** the site where the following stage of photosynthesis takes place. (2mks)

Dark stage

Light stage

9. (a) **Name two** nutrients that do not require digestion before they are absorbed. (2mks)

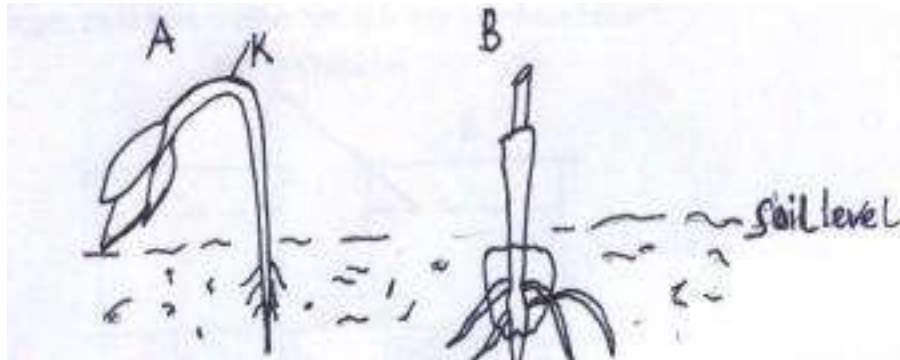
(b) **What** is assimilation? (1mk)

(a) **Give** a reason why the left ventricle muscles are thicker than the right ventricle muscles.

(1mk)

(b) **State** the form in which carbon (IV) oxide is transported in the blood. (2mks).

11. The diagrams below represent a stage of growth in two different seeds.



Identify the type of germination exhibited by seedlings A and B and give a reason for each identity

A

Reason

B

Reason

(b) **State** the function of the part labeled K. 12.

(1mk)

Explain how the following adaptations reduce transpiration in xerophytes

(a) Sunken stomata

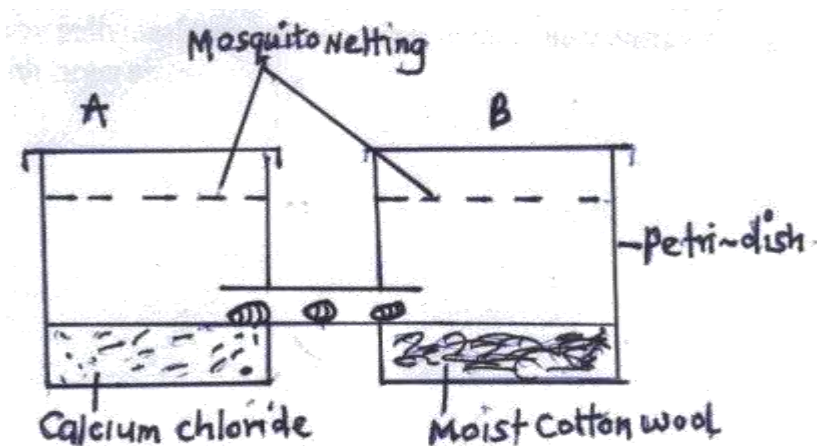
(2mks)

(b) Thick waxy cuticle

(1mk)

The following experiment was set up in a chamber made from two connected Petri dishes.

Housefly maggots were introduced at the centre of the chamber, so the maggots could move to either Petri dish A or B as shown below.



- (a) **Name** the type of response being investigated in the set up. (1mk)
- (b) **State** the survival value of the response named in (a) above. (1mk)
- (c) **Give** the role of calcium chloride in the experiment above. (1mk)

14.(a) **What** is sex linkage? (2mks)

(b) **Name two** sex-linked characteristics in humans. (2mks)

15.**Name** the mechanisms that hinder self —fertilization in flowering plants. (3mks)

16.**Explain** why individuals with smaller sizes require more energy per kg of body weight than those with larger sizes? (3mks)

17.**State** the importance of placenta and amniotic fluid during pregnancy.

Placenta (2mks)

Amniotic fluid (1mk)

18. **Distinguish** between the (a) Divergent two patterns of evolution: and convergent evolution. (2mks)

(b) **Why** was Lamarks theory of evolution rejected? (2mks)

19. **Name** the meristematic tissues (a) Primary growth responsible for: (1mk)

(b) Secondary growth in plants (1mk)

The diagram below represents an organ from a bony fish, **study** the diagram and answer the questions that follow.



(a) **State** the functions of each of the following A and B

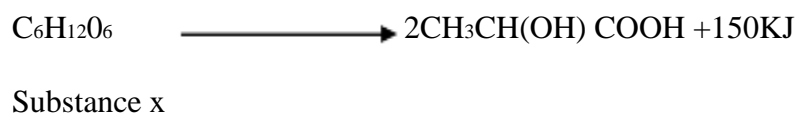
(b) **How** is the structure labeled C adapted to its function? (1mk)

21. **Give** the functions of the following parts of a light microscope (2mks)

Objective lens

Condenser

During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles.



(a) **Name** the process represented above (1mk)

(b) **What** is glycolysis? (1mk)

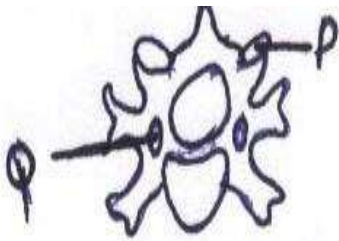
During estimation of cell sizes using a light microscope, a student found out the diameter field of view to be 2.7mm and diameter of field of view had 9 cells. The magnification was x50.

Calculate the actual length of one cell in microns (3mks)

24. **State** the (i) functions of the following fins of a bony fish
Dorsal fin (2mks)

(ii) Pelvic and pectoral fins (2mks)

The diagram below represents the anterior view of a vertebra study it and answer the questions that follow



(a) (i) **Name** the identity of the vertebra (1mk)

Identity

(ii) **State** the function of each of the following structures P and Q (2mks)

P

Q

26.(a) **What** is transpiration?

(1mk)

(b) **Give** the importance of transpiration in green plants.

(2mks)

27.**Distinguish** between habitat and ecological nitche.

PROJECTION NO. 03

Name.....

Index No...../.....

School.....

Candidates Signature.....

Date

231/1

BIOLOGY

THEORY

Paper 1

2 Hours

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number in the spaces provided above.

Sign and write date of examination in the spaces provided above.

Answer **ALL** questions in the spaces provided.

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Question	Maximum Score	Candidates Score
1–31	80	

Answer all questions in the spaces provided.

1. Name **one** of the end products of the dark reaction in photosynthesis (1mk)

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.....

.....

.....

2. Give **two** reasons why higher animals need an internal transport system (2mks)

.....

.....

- a) Explain why a person discharges urine more frequently when environmental temperatures are low than when they are high.

(2mks)

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.....

.....

Name the nitrogenous waster product excreted by a fresh water fish. (1mk)

.....

.....

Why is it important to use dry mass in ecological studies and not wet mass

(2mks)

.....

.....

5. Identify the agent of dispersal of the following: (2mks)

Fruits which split open along sutures when dry, hauling their seeds away from the parent plant.

.....

ii) Light seeds with hairy extensions

.....

Name the **three** main sites in plants through which gaseous exchange takes place
(3mks)

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.....

Liver damage leads to impaired digestion of fats. Explain this statement.
(2mks)

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.....

The diagram below represents an organelle involved in aerobic respiration.



a) Identify the organelle (1mk)

.....

b) Name the parts labeled X and Y. (2mks)

X Y

9. Explain how the xylem vessels are adapted to their function. (3mks)

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In cattle the gene for red hair (designated R) and that of white hair (designated W) are co-dominant. When a red haired bull was mated with a white haired heifer, a roan calf was obtained in F1.

- i) Give the genotypes of the F1 offspring. (1mk)

.....

.....

- ii) Work out the phenotypic ration when the F1 are selfed. (3mks)

11. State the function of the following in reproduction. (3mks)

- i) Placenta

.....

- ii) Acrosome

.....

- iii) Follicle stimulating hormone

.....

12. State **three** evidences of organic evolution. (3mks)

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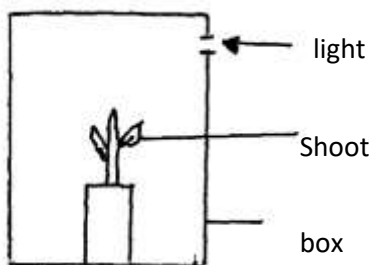
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13. In what form is oxygen transported from lungs to the tissues? (1mk)

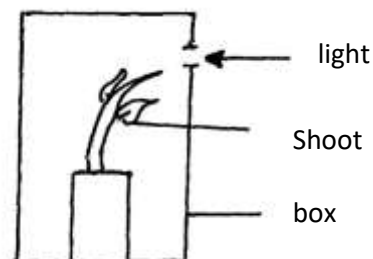
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The diagrams below show an experiment set up using growing bean seedlings. The been seedlings

were enclosed in a dark box with a hole on one side as shown.



At beginning



After four days of growth

- a) What type of response does the shoot above show? (1mk)

.....

- b) Account for the shape of the bean shoot after four days of growth. (3mks)

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.....

Explain why several lateral buds sprout when a terminal bud in a young tree is removed. (3mks)

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16. State **three** factors that affect the rate of diffusion. (3mks)

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.....

Explain how the biceps and triceps muscles bring about the movement at the hinge joint of the elbow in man. (3mks)

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.....

18. Name **one** mechanism that hinders self pollination in flowering plants. (1mk)

.....

19. In what ways are the gill filaments of fish adapted to heir function? (3mks)

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.....

20. State the function of the phloem tissue in plants (1mk)

.....

a) In an experiment, it was found that when maggots are exposed to light, they move to the dark areas.

i) Name the type of response exhibited by the maggots. (1mk)

.....

ii) State the survival value of the response in (a) (i) above. (1mk)

.....

During a road accident, an accident victim suffered head injury and consequently lost memory. Name the part of the brain that was damaged. (1mk)

.....

22. a) What is meant by oxygen debt. (2mks)

.....

.....

b) State one factor that affects basal metabolic rate. (1mk)

.....

23. Explain what happens to excess glucose in the body. (3mks)

.....

.....

.....

a) Name the hard outer covering of the members of the phylum arthropoda. (1mk)

.....

b) State **three** roles played by the structure named in (a) above. (3mks)

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.....

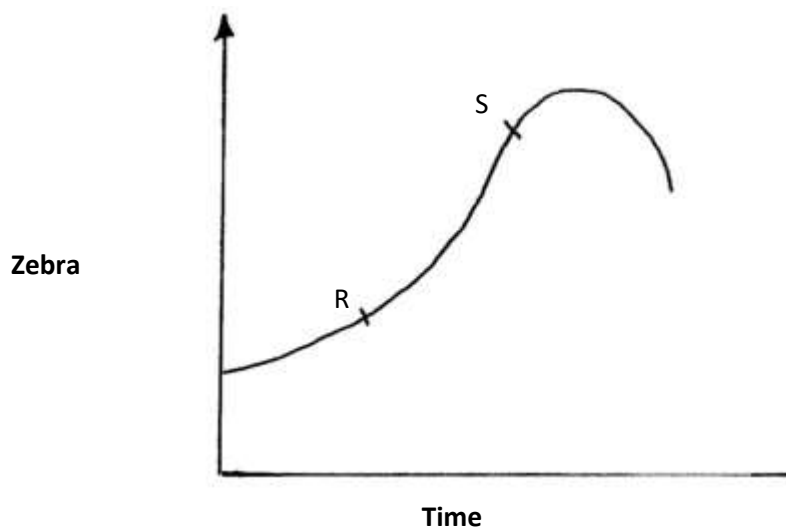
c) State **one** other characteristic of the phylum arthropoda. (1mk)

.....

25. Name **one** sex-linked trait in humans. (1mk)

.....

The graph below represents a population growth curve of zebras in a grassland ecosystem over a period of time.



Account for the change in zebra population between points R and S on the growth curve above (3mks)

.....
.....
.....
.....

b) Name the most suitable method used in estimating the zebra population. (1mk)

.....

Distinguish between convergent and divergent evolution.

(2mks)

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.....

.....

Explain how temperature affects the rate of photosynthesis.

(3mks)

.....

.....

.....

29. Name **two** mechanical tissues which provide support in woody plants. (2mks)

.....

.....

30. State one role of hydrochloric acid secreted by the stomach wall. (1mk)

.....

Explain what would happen to the red blood cells when they are placed in hypotonic solution.

(3mks)

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.....

PROJECTION NO. 04

NAME:

INDEX NUMBER:

SCHOOL:

CANDIDATES SIGNATURE:

DATE:

231/1

BIOLOGY

THEORY

PAPER 1

2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number in the spaces provided above.
Answer **ALL** the questions in the spaces provided

For Examiners use only.

Question	Maximum Score	Candidates Score
1-29	80	

Define;

- a) Inter-specific competition (1mk)

.....
.....

- b) Intra-specific competition (1mk)

.....
.....

The diagram below is of a stage in cell division



- With a reason identify the stage. (2mks)

Stage

Reason

3. Name two mutagenic agents. (2mks)

.....
.....

4. The scientific name of the housefly is *Musca domestica*. Classify the fly into; (2mk)

i) Genus

.....

ii) Species

.....

Cyanide is classified as one of the non-competitive inhibitors of enzymes. What is the meaning of the term non-competitive inhibitor? (2mks)

.....

.....

.....

Name two Vitamins of which their absence in the diet may cause a dental disease called gingivitis(2mks)

.....

.....

.....

7. State three factors that maintain the transpiration stream. (3mks)

.....

.....

.....

State the economic importance of each of the following plant excretory products.

Cocaine (1mk)

.....

Caffeine (1mk)

.....

Nicotine(1mk)

.....

a) Why is Lamarck's theory on mechanism of evolution not scientifically

.....

.....

.....

What name is given to;

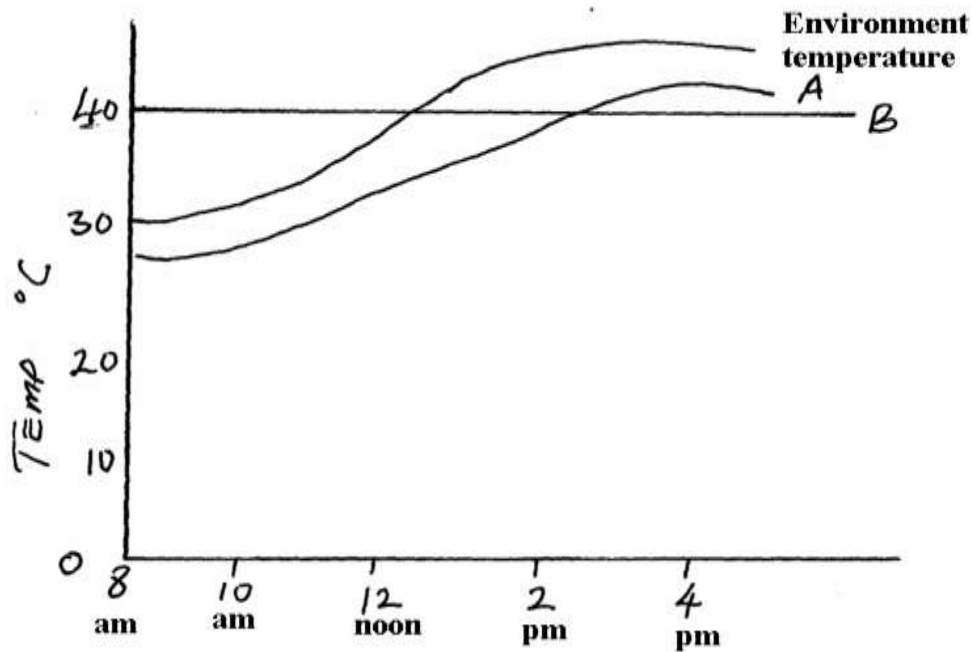
Structures in animals that have become reduced in size until they are
functionless(1mk)

Evolution of structures that have undergone modification to adapt the
organism to similar ecological niches. (1mk)

.....

The body temperatures of two animals A and B varied as below with environmental

Temperature



Which of the animals is;

i) Endothermic (1mk)

ii) Ectothermic (1mk)

b) With a reason, state which of the animals is likely to be widely distributed (2mks)

.....

.....

.....

11. a) State a structural difference between a sensory and motor neurone (2mks)

.....

.....

.....

b) What is a reflex arc? (2mks)

.....

.....

.....

Identify the type of gene mutations represented by the following pairs of words.

i) Shirt instead of skirt (1mk)

Hopping instead of shopping (1mk)

Eat instead of tea (1mk).

13. State three adaptations of halophytes to their habitat (3mks)

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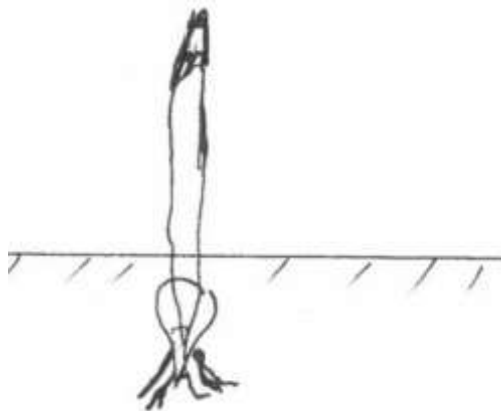
14. State three roles of oestrogen during the menstrual cycle (3mks)

.....

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.....

A form IV student observed a seedling germinate as below



With a reason identify the type of germination above. (2mks)

.....

.....

.....

A man of blood group heterozygous **A** married a woman of heterozygous **B**; work

Out the blood groups of their children (3mks)

.....

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.....

.....

a)How is the stigma of a wind pollinated flower adapted to its function? (1mk)

.....

.....

b) Define the term double fertilization in plants? (2mks)

.....

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.....

State three characteristics of cells at the zone of cell division in an apical meristem (3mks)

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.....

19. Explain the importance of the label “CFC FREE” on modern refrigerators (3mks)

.....

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.....

20. Name three biotic factors of an ecosystem (3mks)

.....

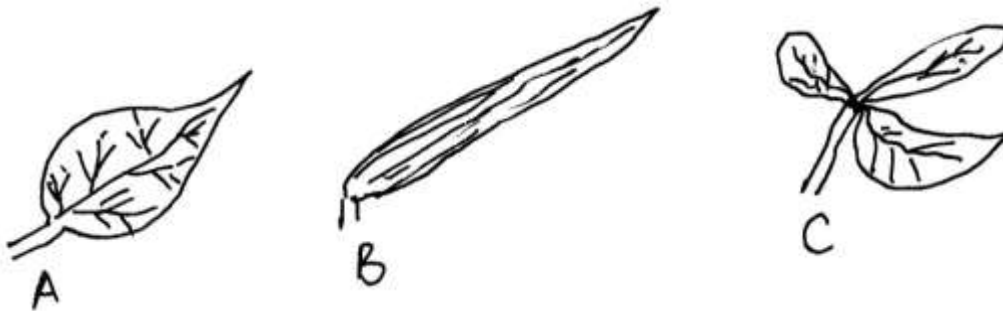
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Below are diagrams of three leaves A, B and C. Construct a two step dichotomous

key which can be used to identify each of them.

(4mks)



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A Form IV student observed an heterotrophic organism with jointed appendages and whose body was divided into head, thorax and abdomen. Classify the organism into;

- Kingdom..... (1mk)
- ii) Phylum (1mk)
- iii) Class (1mk)

Define;

Pulmonary circulation(1mk)

.....

Systemic circulation (1mk)

.....

24. Name three diseases against which children are immunized (3mks)

.....

.....

.....

Name the site for gaseous exchange in the following animals

- Insects (1mk)
- Fish(1mk)
- iii) Mammals (1mk)

Students estimating the number of grasshoppers in a field captured 72 grasshoppers

which they marked and released. After two days the students captured 90 grasshoppers of which 8 were marked.

a) Why did the second capture take place after two days? (1mk)

.....

..... b)

Calculate the total number of grasshopper in the field (3mks)

.....

.....

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.....

27. Name the contractive agent of typhoid and state two symptoms of the disease (3mks)

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.....

28. Name two neurotransmitter substances across neurons (2mks)

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.....

.....

29. What type of variation is exhibited by the ability of man to roll or not roll the tongue? (1mk)

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PROJECTION NO. 05

Name.....

Index No...../.....

School.....

Candidate's Signature.....

Date

231/1

BIOLOGY

THEORY

Paper 1

2 Hours

INSTRUCTIONS TO CANDIDATES

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Question	Maximum Score	Candidates Score
1–28	80	

1. a) State the functions of the following cell organelles. (2mks)

Ribosomes

.....

ii) Lysosomes

.....

- b) Name the only epidermal cell in plants that contain chloroplast. (1mk)

.....

2. a) Name the causative agents of the following diseases. (2mks)

i) Amoebic dysentery

.....

Tuberculosis

.....

- a) What is the importance of the counter current flow in the exchange of gases in a fish. (2mks)

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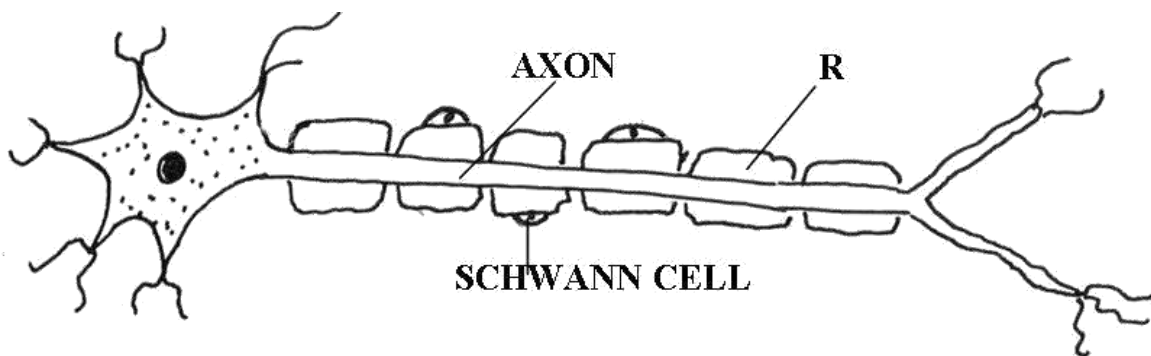
..... State

- b) **two** ways in which the tracheoles of an insect are adapted to their functions. (2mks)

.....

.....

- 4 The diagram below shows a type of a neurone.



- a) Identify the neurone above. (1mk)

.....

- b) Give a reason for your answer in 4(a) above. (1mk)

.....

- c) State the function of the part labeled R (1mk)

.....

Use an arrow on the diagram to show the direction of the impulse transmission along the neurone.

(1mk)

The equation below represents a reaction that occurs during respiration in a cell.



Identify the compound K.

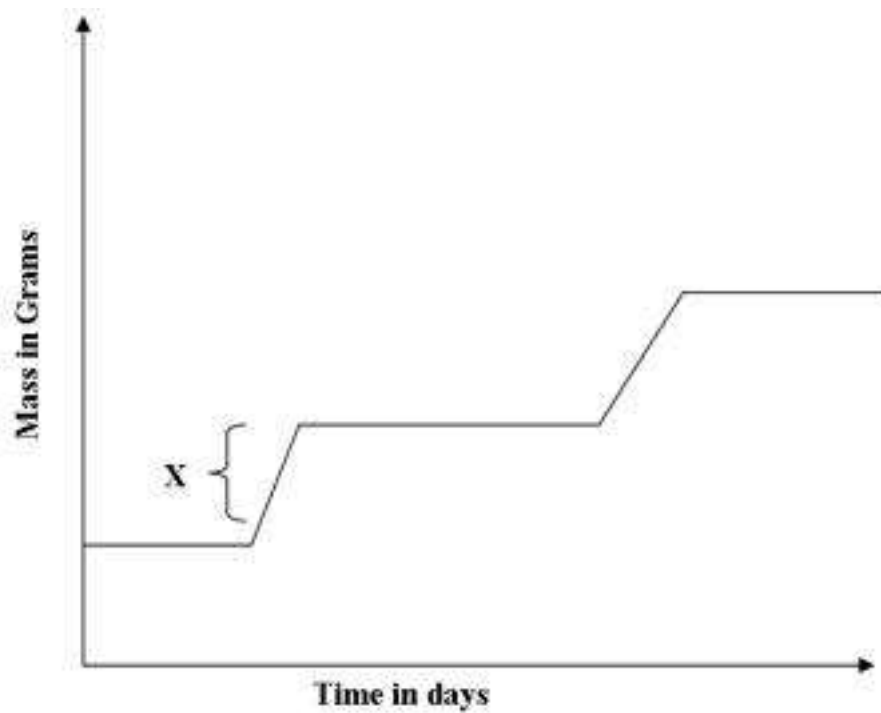
(1mk)

.....

- b) State **two** differences between K and ATP. (2mks)

-
-
- c) Name the organelle responsible for the production of energy in a cell muscle (1mk)
-

The graph below represents the growth pattern of animals in a certain phylum.



- a) Name the type of growth curve shown above. (1mk)
-
- b) i) Identify the process represented by x. (1mk)
-
- ii) Name the hormone responsible for the process in b (i) above.
-
- c) State the importance of the growth of a pollen tube to a plant. (1mk)

-
7. State **three** factors that affect absorption of mineral ions by plant roots. (3mks)

.....

.....

.....

Explain how crops grown along roads can be a source of lead poisoning to human beings.
(2mks)

.....

.....

Name the type of responses exhibited by.

- a) Tendrils when they twine on a support object. (1mk)

.....

Butterflies and moths fly into wind currents in order to detect scent of flowers. (1mk)

.....

The equation below represents a metabolic process that occurs in the mammalian liver.

Amino acids \longrightarrow Organic compound + urea.

Enzyme x

- a) Name the process that represents the above equation. (1mk)

.....

- b) Identify the enzyme represented by x. (1mk)

.....

- c) What is the importance of the process to the mammal (1mk)

.....

A scientist carried out blood sugar test for a given patient at three different times of the day. He obtained the results shown below for glucose and glycogen level.

Time	6 a.m.	1.30 p.m.	4 p.m.
Glucose	90mg	100mg	90mg
Glycogen	20mg	40mg	60mg

Account for:

Presence of glycogen in blood.

(2mks)

.....

b) Rise in glucose and glycogen levels at 1.30p.m

(2mks)

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.....

.....

12. a) What is the meaning of alterations of generations. (2mks)

.....

.....

.....

.....

b) Name one plant division which displays alteration of generation. (1mk)

.....

Explain why plants growing in low altitude areas grow faster than those in high altitudes. (3mks)

.....

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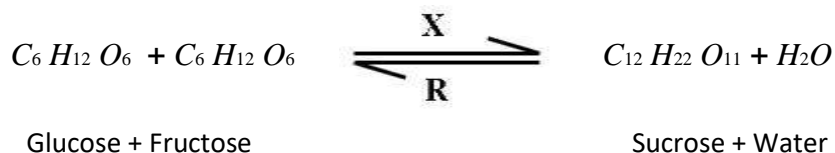
.....

a) What is the function of Sodium hydrogen Carbonate that is added to test solution of non-

reducing sugar. (1mk)

.....

The equation below represents a process X which is controlled by enzymes .



i) Name the process X and enzyme R

Process X (1mk)

Enzyme R (1mk)

15. State **two ways** through which plants eliminate their metabolic wastes from their bodies (2mks)

16. a) What is double fertilization in flowering plants? (1mk)

.....

.....

.....

b) Name any two types of placentations found in ovaries. (2mks)

.....

.....

.....

List down **four** phenotypic characteristics that have been selected for the production of strains suitable for modern agricultural purposes.

(4mks)

.....

.....

.....

.....

18. a) Name any **two** accessory glands in the male urinogenital system. (2mks)

.....

.....

What structural modification do human sperm cell have that:

- i) Facilitate energy use. (1mk)

.....

- ii) Facilitate movement. (1mk)

.....

Name the type of eye defects that can be corrected by;

- i) Use of bifocal lens (1mk)

.....

- ii) Use of artificial lens (1mk)

iii) Use of concave lens (1mk)

a) The length from the tail tip to the anus of a certain tilapia fish is 10cm. The length from the tail tip to the mouth is 35cm. Calculate the tail power of the fish. (Show all your working). (2mks)

b) What is the significance of high tail power in fish? (1mk)

State the roles of each of the following hormones in the process of reproduction in human male.

i) Follicle stimulating hormone. (1mk)

ii) Luteinising hormone. (1mk)

22. List down three differences between the endocrine system and nervous system. (3mks)

Endocrine system	Nervous system
i.	i.
ii	ii
iii	iii

Distinguish between the struggle for existence and survival for the fittest as used in the theory of natural selection. (2mks)

.....

.....

.....

State **three** structural feature of the placenta which facilitates the diffusion of substance between the maternal and foetal blood. (3mks)

.....

.....

.....

25. Give one functional difference between a tendon and a ligament in a mammal. (1mk)

.....

26. State the functions of the following parts of a light microscope. (2mks)

i) Diaphragm.....

ii) Objective lens.....

Explain how the following adaptations minimizes rate of transpiration.

i) Sunken falling (2mks)

.....

ii) Leaf dropping (1mk)

.....

28. State **one** structural difference between mature red blood cells and white blood cells. (1mk)

.....

.....

.....

PROJECTION NO. 06

NAME:

INDEX NUMBER:

SCHOOL:

CANDIDATES SIGNATURE:

DATE:

231/1

BIOLOGY

THEORY

PAPER 1

2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number in the spaces provided above.
Answer **ALL** the questions in the spaces provided

For Examiners use only.

Question	Maximum Score	Candidates Score
1-30	80	

State the organelles that perform the following functions

(3mks)

Synthesis of ribosomes

Transport of lipids

Package and transport of glycol-proteins

During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles.

$C_6H_{12}O_6$

$2CH_3CH(OH)COOH + 150\text{ KJ}$

Glucose

Substance X

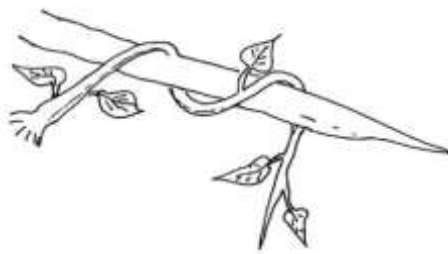
What is the name of this process.....(1mk)

Name the substance X (1mk)

c) What happens to the muscles if X accumulate to critical levels (1mk)

.....
.....

A response exhibited by a certain plant tendril is illustrated below.



a) Name the type of response (1mk)

.....

b) Name the type of plants that uses the named response in (a) above for support (1mk)

.....

.....

Explain what would happen to the following cells transferred from their normal condition into

distilled water a) Amoeba (2mks)

.....

.....

.....

.....

b) A plant parenchyma cell (2mks)

.....

.....

.....

.....

5. a) Name the structure in the body that detects changes in internal temperature (1mk)

.....

b) State two physiological changes that occur in human body when internal temperature tends to drop below normal (2mks)

.....

.....

Explain how the following factors affect the rate of transpiration.

i) Sunken stomata (2mks)

.....

.....

.....

.....

ii) Light intensity (2mks)

.....

.....

.....

.....

7. State the function of cardiac sphincter in the stomach (2mks)

.....

.....

.....

.....

8. a) What is meant by the term sex-linked genes? (1mk)

.....

.....

b) Give an example of a sex linked trait in humans on (2mks)

Y – chromosome.....

X – chromosome

9. Name three processes in living things that depend on diffusion. (3mks)



.....

.....

.....

.....

.....

10. a) State the difference between ball and socket joint and the hinge joint (1mk)

.....

.....

b) Name the structures that join bones together to form a joint (1mk)

.....

.....

c) Name the structures at the elbow that performs the same function as the patella (1mk)

.....

.....

State the function of each of the following parts of the human ear.

(3mks)

Ear ossicles.....

Cochlea.....

Semi-circular canals.....

List two advantages of staining cells and tissues before observing them under the microscope

(2mks)

.....

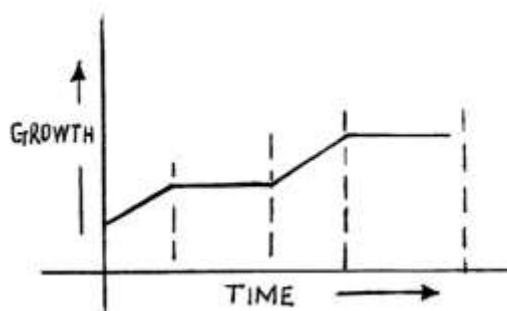
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.....
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13. Of what importance is Luteinising hormone in male reproductive system (1mk)

.....
.....

The graph shows a growth curve of insects.



- a) State one feature that is responsible for the pattern of growth shown by insects (1mk)

.....
.....

How do insects overcome the limitation so that growth occurs after all?
(1mk)

.....
.....

15. What are the structural units of lipids? (2mks)

.....
.....
.....
.....

16. State the importance of the following features in gaseous exchange (2mks)

a) Presence of cartilage in trachea and bronchi

.....
.....

Alveoli, gill filaments, tracheoles being numerous in the respective organisms where they occur

.....
.....

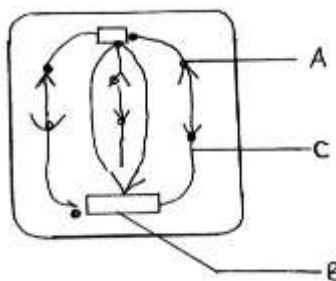
17. a) State the major factor in the 'Global warming' experienced in the world today (1mk)

.....
.....

b) Suggest two ways of reducing the Global warming (2mks)

.....
.....
.....
.....

The diagram shows an epidermal cell undergoing mitotic cell division.

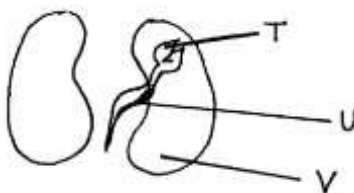


i) Name the stage of mitosis it represents(1mk)

Name the structures A (1mk)

C..... (1mk)

The diagram shows a bean seed split open.



a) Label the parts

T (1mk)

U (1mk)

b) Of what importance is structure U to the bean plant? (2mks)

.....

.....

.....

.....

In an investigation, a group of students came across animals living in the following habitats.
What was the likely main nitrogenous waste product of each in its habitat (3mks)

Habitat	Nitrogenous waste
Terrestrial	
Fresh water	
Marine	

21. a) Name the organism that causes malaria (1mk)

.....

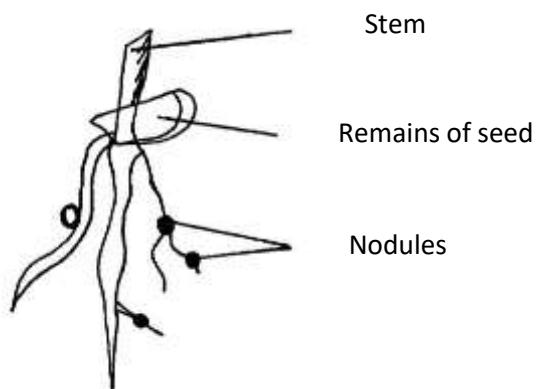
.....
b) Name two ways of preventing this disease (2mks)

.....
.....
.....
.....

22. Explain what will happen if Rh^+ blood is transfused into a recipient of Rh^- blood. (2mks)

.....
.....
.....
.....

Shown below is a section of a leguminous plant uprooted from a school farm. Study it carefully and use it to answer questions that follow.



a) State the micro-organism found in the nodules (1mk)

.....

.....
b) State the importance of the micro-organism to the soil. (1mk)

.....
.....

State the role of the following in Homeostasis

ADH(1mk)

.....
.....

ii) Aldosterone (1mk)

.....
..... What
is meant by the term natural selection (3mks) 25.

.....
.....
.....
.....

What is the role of corpus luteum in

i) Menstrual cycle (2mks)

.....
.....
.....
.....

ii) Early pregnancy (2mks)

.....

.....

.....

.....

27. State two adaptations of herbivores which enable them to digest cellulose (2mks)

.....

.....

.....

.....

What is meant by:

a) Organic evolution (2mks)

.....

.....

.....

.....

b) Adaptive radiation (2mks)

.....

.....

.....

.....

29. Explain would happen if a person slept in a poorly ventilated room with a burning jiko (3mks)

.....

.....

.....

.....

.....

.....

PROJECTION NO. 07

Name..... Index No...../.....

School..... Candidate's Signature.....

Date

231/1

BIOLOGY

THEORY

Paper 1

2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number in the spaces provided above.

Sign and write date of examination in the spaces provided above.

Answer **ALL** questions in the spaces provided.

For Examiners use only.

Question	Maximum Score	Candidates Score
1–28	80	

-1. The table below shows the concentration of some ions in pond water and in the cell sap of an aquatic plant growing in the pond.

Ions	concentration in pond	concentration in cell
	Water (parts per million)	sap (parts per million)
Sodium	50	30
Potassium	2	150
Calcium	1.5	1
Chloride	180	200

Name the process by which potassium ions could have been taken by this plant. (1mk)

.....

State **one** condition necessary for the process named in (a) above to take place. (1mk)

.....

- a) A student was viewing a slide preparation of a cheek cell under high power of a

microscope. The features of the cell were blurred. Name the part of the microscope that the student would use to obtain a sharper outline of the features. (1mk)

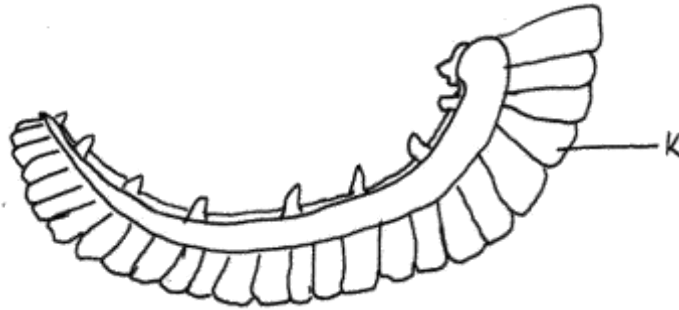
.....

- b) Give the formula used to calculate magnification in light microscope. (1mk)

.....

.....

The diagram below represents an organ from a bony fish. Study the diagram and answer the questions that follow.



Name the organ. (1mk)

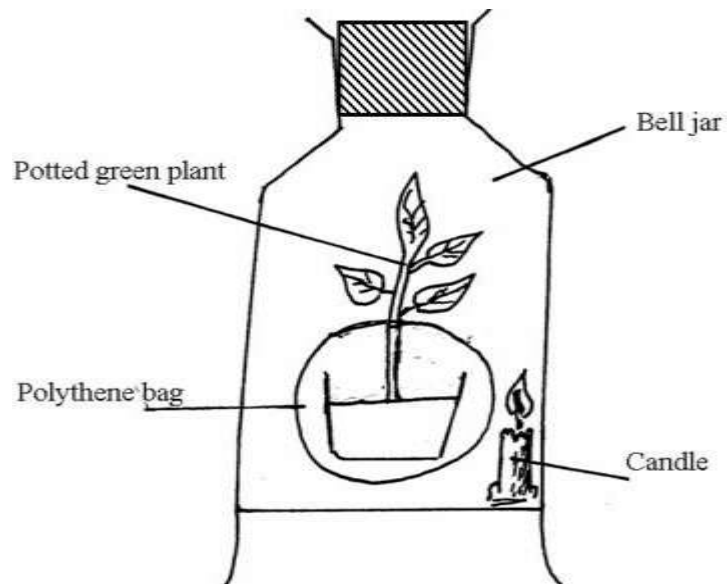
.....

State **three** ways in which part K is adapted to its function. (3mks)

.....

.....

A student investigating an aspect of photosynthesis set up an experiment as shown in the diagram below.



The bell jar was made air tight. After some time the candle went off. The student then placed the set-up in direct sunlight for 5 hours.

a) Give a reason why the burning candle was inclined. (1mk)

.....

b) Suggest a reason why it was necessary to cover the pot with polythene bag. (1mk)

.....

.....

Explain how sunken stomata lower the rate of transpiration.

(2mks)

.....

.....

.....

6. State **three** functions of mammalian blood other than transport of substances. (3mks)

.....

.....

.....

State **three** ways in which the ileum is structurally adapted to the absorption of digested food.

(3mks)

.....

.....

.....

.....

8. State how mitochondria is adapted to its function. (2mks)

.....

.....

.....

State how xylem is adapted to its function.

(3mks)

.....

.....

10. State functional differences between arteries and veins. (2mks)

Arteries	Veins

11. What is oxygen debt? (2mks)

.....

.....

12. What is the importance of sebaceous glands in the human skin? (2mks)

.....

.....

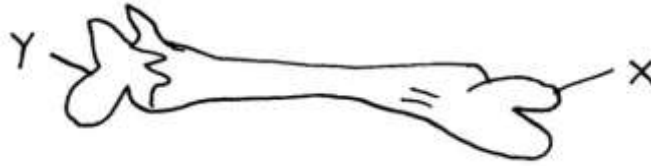
.....

13. Name the hormones responsible for the regulation of blood sugar level. (2mks)

.....

.....

The diagram below represents a mammalian bone.



- a) Identify the bone. (1mk)

.....

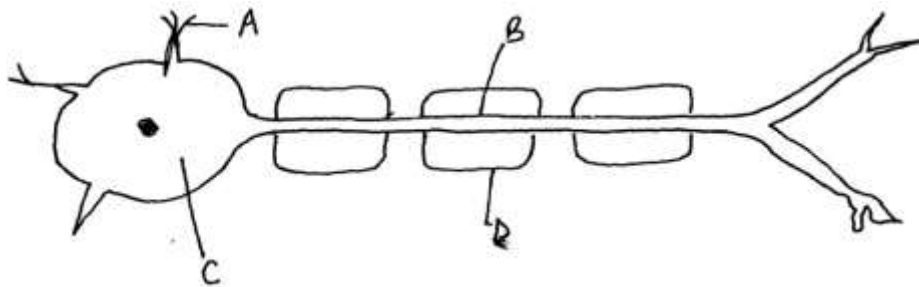
- b) Name part labeled Y (1mk)

.....

- c) Name the type of joint formed at the part labeled X. (1mk)

.....

15.



- a) Name the parts labeled A and C. (2mks)

A.....

C.....

- b) State the functions of part labeled B and D. (2mks)

B

D.....

In guinea pig, there are two alleles for hair colour, black and white. In a breeding experiment, all the F1 phenotypes produced from a cross between pure-breeding black-haired and pure-breeding white-haired parent had black hair.

(Use letter B to represent gene for hair colour)

a) What is an allele (1mk)

.....

.....

b) Work out the phenotypic ration of the F2 generation. (4mks)

Name parts of brain which control:

a) Involuntary activities eg. Breathing (1mk)

.....

b) Control voluntary body movements. (1mk)

.....

18. Define the following terms: (2mks)

Cephalothorax

.....

.....

Eukaryotes

.....

.....

Below are four types of compound leaves



Identify the four types of compound leaves.

(4mks)

.....

.....

.....

.....

To estimate the population of grasshoppers in Kogelo village 400 grasshoppers were caught, which were marked and released. After 24 hours 200 grasshoppers were caught out, of which 80 had been marked.

Suggest the possible instrument that may have been used for capturing the grasshoppers. (1mk)

.....

b) Estimate the population size of the grasshoppers in the village. (2mks)

21. Explain how the following features assist in adapting xerophytes to their habitat. (2mks)

Folded leaves

.....
.....

Leaves modified to spines

.....
.....

22. State the changes that occur in a nerve axon to produce an action potential. (3mks)

.....
.....
.....

Industrial wastes may contain metallic pollutants. State how such pollutants may indirectly reach and accumulate in the human body if the wastes were dumped into rivers.(3mks)

.....

.....

.....

.....

Name the causative agent of cholera.

(1mk)

.....

25. What is double fertilization in flowering plants. (2mks)

.....

.....

.....

a)During implantation in a mammal, the blastocyst differentiates into 3 layers, which are: (3mks)

.....

.....

.....

Which of the layers named in (a) above normally differentiates to form the placenta.

(1mk)

.....

27. State **four** ways of breaking dormancy in a seed.

(4mks)

.....

.....

.....

.....

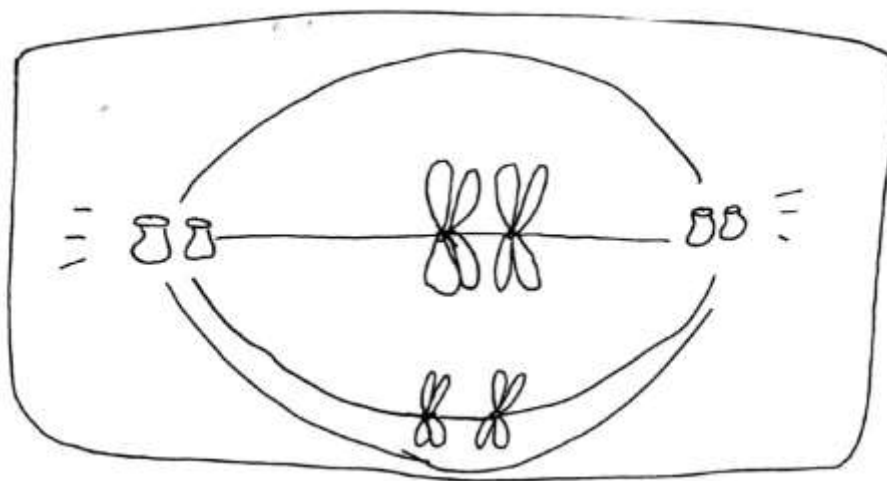
a) Name the hormone responsible for metamorphosis during larval stage of an insect. (1mk)

.....

State the source of the hormone. (1mk)

.....

Below is a stage of cell division.



a) Identify the stage.

(1mk)

.....

b) Give reasons for your answer in (a) above. (2mks)

.....

.....

State structural difference between sclerenchyma and colenchyma tissues. (2mks)

Sclerenchyma	Colenchyma

PROJECTION NO. 08

Name..... Index No.....

231/1

BIOLOGY

Date.....

(Theory)

2 hours

Instructions

Write your Name and Index Number in the spaces provided above.
Write the date of the examination in the space provided above.
Answer all the questions in the spaces provided.

For Examiner's use only

Question	Maximum Score	Candidate's Score
1-25	80	

END

1. Name the tissues whose cells are thickened with:

a) Cellulose and pectin.

(1mk)

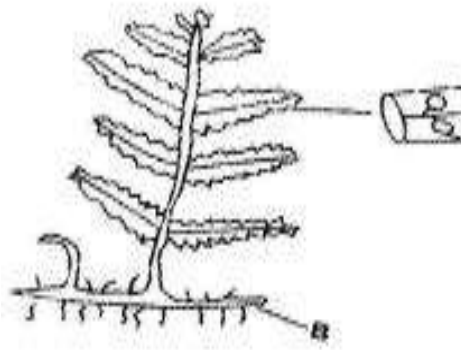
.....

b) Lignin.

(1mk)

.....

2. The diagram below represents a fern.



(a) Name Parts labeled A and B.

(2mk)

.....

.....

(b) To which division does the plant belong?

(1mk)

.....

State three measures that can be taken to control infection of man by protozoan parasites (3mk)

.....

.....

.....

.....

4. Explain how the following factors hinder self pollination in plants:

(i) Protogyny (1mk)

.....

.....

(ii) Dioecism (1mk)

.....

.....

5. Explain the likely effect on humans and other organisms of untreated sewage discharged into water body that supplies water for domestic use. (3mk)

.....

.....

.....

.....

.....

.....

6. Name two structures in herbaceous stems that enhance their support. (2mk)

.....

.....

.....

.....

7. a) Define the term immunity. (1mk)

.....

.....

.....

- b) Distinguish between natural immunity and acquired immunity. (1mk)

.....

.....

.....

.....

c) Identify one immunizable disease in Kenya. (1mk)

.....

8. State three differences between osmosis and active transport. (3mk)

.....

.....

.....

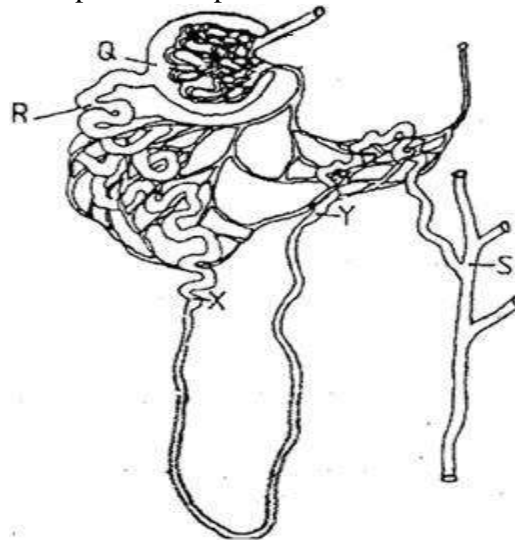
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9. The diagram below illustrates part of a nephron from a mammalian kidney.



a) Name the fluid found in the part labeled Q. (1mk)

.....

Identify the process responsible for the formation of the fluid named in (a) above.

(1mk)

.....

c) Which two hormones exert their effect in the nephron? (2mk)

.....

.....

.....

State three characteristics of members of kingdom Monera that are not found in other kingdoms.

(3mk)

.....

.....

.....

.....

.....

11. What is meant by the following biological terms?

i) Crenation

(1mk)

.....

.....

ii) Haemolysis

(1mk)

.....

.....

iii) Plasmolysis

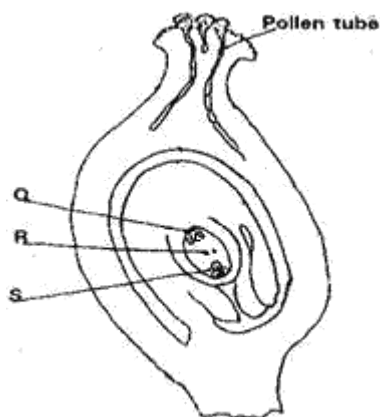
(1mk)

.....

.....

12. The diagram below shows a stage during fertilization in flowering plant.





a) Name the parts labeled Q, R, and S. (3 mk)

.....

R

S

b) State the function of the pollen tube. (1 mk)

.....

.....

.....

a) State the major factor in the 'Global warming' experienced in the world today. (1mk)

.....

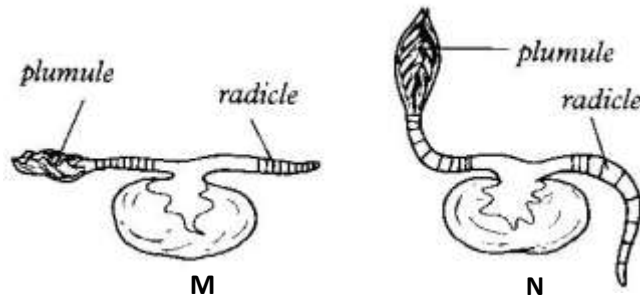
b) Suggest two ways of reducing the Global warming. (2mk)

.....

.....

.....

An experiment was set to investigate a certain aspect of response. A seedling was put on a horizontal position as shown in figure M below. After 24 hours, the set up was as shown in figure N.



a) Name the response exhibited. (1mk)

.....

b) Explain the curvature of the shoot upwards. (3mk)

.....

The paddles of whales and the fins of fish adapt these organisms to aquatic habitats.

a) Name the evolutionary process that may have given rise to these structures. (1mk)

.....

b) What is the name given to such structures? (1mk)

.....

c) Give two examples of vestigial organs in man. (2mk)

.....

.....

.....

a) Name a protein and vitamin involved in blood clotting.

Protein.(1mk)

.....

ii) Vitamin

(1mk)

.....

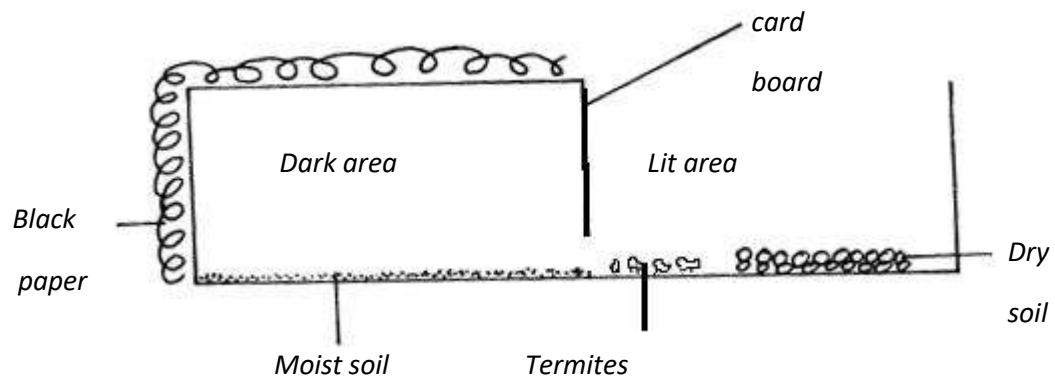
b) Explain why blood is not normally used for transfusion after one month. (1mk)

.....

.....

.....

A group of Form four students set up an experiment to investigate a biological process using termites. They used a small box in which a portion was covered with black paper and had moist soil. The open part had dry soil. Termites were placed inside in open area of the box.



a) Predict what happened to the termites after 30 minutes.

(1mk)

.....

b) What form of response is exhibited by termites? (1mk)

.....

c) State one biological significance of the above response to termites.(1mk)

.....

.....

18. a) Name two fins in a bony fish which perform the following functions:-

i) Changing direction. (1mk)

.....

ii) Control pitching. (1mk)

.....

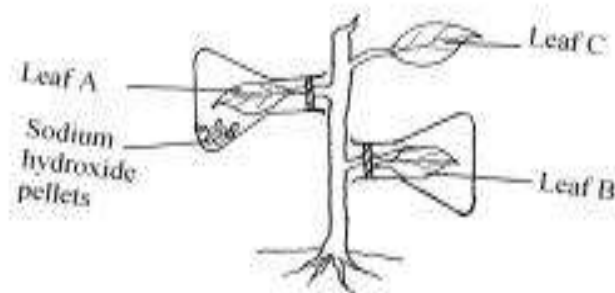
(b) State the role of myotomes in fish. (1mk)

.....

.....

.....

19. The diagram below represents an experimental set up to investigate a certain scientific concept. The potted plant was first destarched by keeping it in dark for four days.



The set up was then placed in sunlight for five hours and leaves were tested for starch.

a) What scientific concept was being investigated? (1mk)

.....

.....

i) Give the results likely to be obtained after starch test for A and B.

A and B.

A (1mk)

B (1mk)

ii) Account for the results in leaf A in b (i) above. (1mk)

.....

.....

.....

c) Why was leaf C included in the set-up? (1mk)

..... 20. a)

Explain the importance of transport in plants. (2mk)

.....

.....

.....

b) What is the role of root hairs in plants? (1mk)

.....

.....

21. a) Identify the source of urea that is removed via the kidneys in a healthy human being.

(1mk)

.....

.....

Explain why a pregnant woman excretes less urea compared to a woman who is non-pregnant.(2mk)

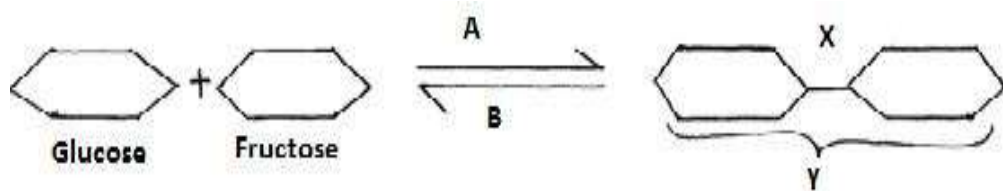
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.....

22. Study the reaction below and answer the questions that follow.



a) What biological processes are represented by A and B? (2mk)

A

B

b) Identify the product Y. (1mk)

.....

c) State the bond represented by X. (1mk)

.....

23. Explain the events of the light stage of photosynthesis. (3mk)

.....

.....

.....

.....

.....

.....

24. Explain what happens in humans when the concentration of glucose in the blood rises above the normal level. (3mk)

.....

.....

.....

.....

.....

.....

25. a) Outline the main features of Lamarckian theory of evolution. (2mk)

.....

.....

.....

.....

In view of modern genetics, explain why Lamarck's theory is unacceptable. (1mk)

.....

.....

.....

c) Name one factor in nature that increases the process of evolution. (1mk)

.....

.....

PROJECTION NO. 09

Name:

Index No.

School:

Candidate's Signature.....

Date:

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:-

Write your **name**, **index number** and **school** in the spaces provided.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

For Examiner's Use Only

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-29	80	

The scientific name for French bean is *Phaseolus vulgaris*

(a) What taxon does the term Phaseolus represents? (1 mark)

.....

(b) State **two** rules that are followed when giving a scientific name to an organism. (2 marks)

.....

.....

2. a) What is the function of the mirror in the microscope? (1 mark)

.....

b) Which organelle would be abundant in:

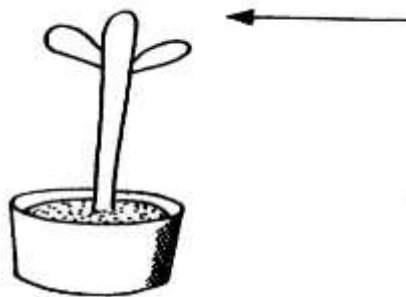
Skeletal muscle cell (1 mark)

.....

Palisade cell (1 mark)

.....

A seedling shoot was exposed to unidirectional light as shown below. The set up was left in the dark room for three days.



i) Make a drawing of the expected results at the end of the experiment. (2 marks)

.....

.....

ii) Explain the expected results at the end of experiment. (2 marks)

.....

.....

State **two** advantages of breathing through the nose than through the mouth. (2 marks)

.....

.....

5. Name **two** mineral elements required in the synthesis of chlorophyll. (2 marks)

.....

.....

6. a) State **two** environmental condition that can cause seed dormancy. (2 marks)

.....

.....

b) Name the part of the leaf that elongates to bring about epigeal germination. (1 mark)

.....

7. a) State the function of amylase in human body. (1 mark)

.....

.....

b) Name **two** parts of the alimentary canal where amylase is secreted. (2 marks)

.....

.....

8. a) Name **two** photochemical cells in human retina. (1 mark)

.....

.....

b) Name **one** chemical substance and two mineral ions involved in impulse transmission in mammals.

(2 marks)

.....

.....

9. Give the function of melanin pigment produced in the skin of man. (1 mark)

.....

10. What is the importance of saprophytic bacteria in an ecosystem? (1 mark)

.....

.....

A student while carrying out an experiment observed 8 cells across the field of view of light microscope. If the diameter of the field of view is 5 mm, calculate the average length of each cell

in micrometers.

(2 marks)

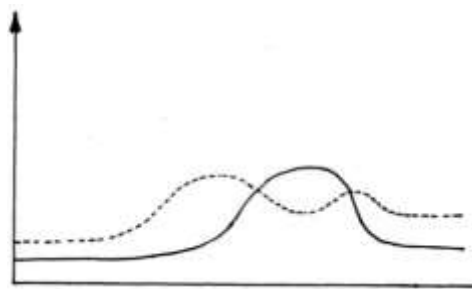
State **one** feature present in the flowers that can be used to distinguish between a monocotyledonous flower and dicotyledonous flower.

(1 mark)

.....

The graph below shows levels of oestrogens and progesterone during the human menstrual cycle.

Mark on the graph the curve that represents



i) Progesterone

.....

ii) Oestrogen

.....

b) Which is the most likely day of ovulation from the graph? (1 mark)

.....

14. a) What are fossils? (1 mark)

.....

.....

b) State **two** limitations of the use of fossils as an evidence of evolution. (2 marks)

.....

.....

Name the type of skeleton in:

i) Grasshopper (1 mark)

.....

ii) Sheep (1 mark)

.....

Name the type of response shown by;

a) Leaves of *Mimosa pudica* when they fold after being touched. (1 mark)

.....

b) Sperms when they swim towards ovum (1 mark)

.....

c) Euglena when they swim towards the source of light. (1 mark)

.....

-
- 17 a) Give an example of sex linked trait on x-chromosome. (1 mark)
-

- b) Below is a nucleotide strand. (1 mark)

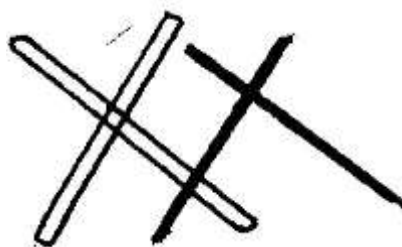
A	A	G	T	C
---	---	---	---	---

- i) Identify the type of nucleic acid strand. (1 mark)
-

- ii) Give your reason for your answer in (b) (i) above. (1 mark)
-

- iii) Write down the complimentary base sequence in the other strand. (1 mark)
-

The diagram below shows a stage in cell division



- i) Name the stage of the cell division that exhibits the process above. (1 mark)
-

- ii) What is the significance of the phenomenon shown to a species? (1 mark)
-
-

Differentiate between respiration and respiratory surface. (2 marks)

.....

.....

20. State **two** adaptations of skin of the frog to gaseous exchange. (2 marks)

.....

.....

a) A man's urine gave a positive reaction with Benedict's solution. Name the disease he was suffering from. (1 mark)

.....

.....

b) State **two** ways in which the symptoms of the condition in (a) can be controlled. (2 marks)

.....

.....

A student collected an organism in the school compound and noted it had a segmented body

and two pairs of legs per body segment.

i) Name the class to which the organism belongs. (1 mark)

.....

.....

ii) State **two** other features the student may have observed. (2 marks)

.....

.....

a) Name **two** structures of gaseous exchange in aquatic plants. (2 marks)

.....

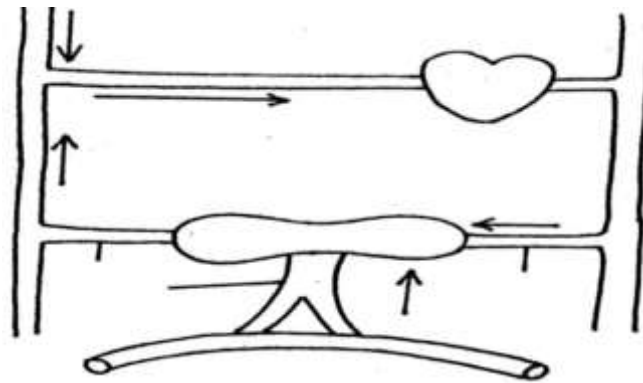
.....

What is the effect of contraction of the diaphragm muscles during breathing in mammals? (2 marks)

.....

.....

The diagram below represents part of the mammalian blood circulatory system and some associated glands.



Name the blood vessels **A** and **B** (2 marks)

.....

.....

(b) State **two** structural differences between the blood vessels labelled **A** and **C** (2 marks)

.....

.....

A student made equidistant marks on a radical of a dicotyledonous seedling. After three days the distance between the marks was measured.

a) What was the aim of the experiment? (1 mark)

.....
.....
b) Predict the results that were likely to be obtained by the student (2 marks)

.....
.....
26. a) Name the disease caused by H.I.V (1 mark)

.....
b) Give **two** reason why it is difficult to cure the disease named above. (2 marks)

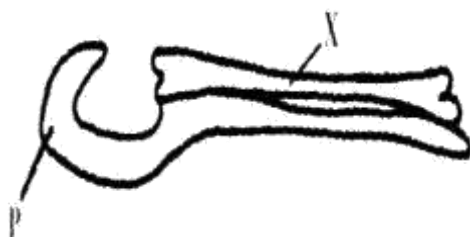
.....
c) Give **one** preventive measure of the named disease. (1 mark)

.....
Plants of a particular species grown in certain habitat flower at the same time. What is the importance of this adaptation

(1 mark)

.....
.....
28. State **two** roles played by the bark in plants (2 marks)

.....
The diagram below represents a bone obtained from a mammal.



i) Name bone labelled X.

(1 mark)

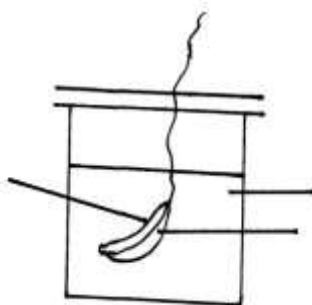
.....

ii) Name structure P.

(1 mark)

.....

A student mashed a piece of ripe banana and made it into paste by adding water, place the paste in a visking tubing and suspended it in a beaker containing iodine solution as shown below. The set up was left for 40 minutes.



a) State the physiological process under investigation.

(1 mark)

.....

b) Account for the result obtained in the table.

(2 marks)

.....

.....
.....

Industrial waste may contain metallic pollutants. Explain how the pollutants may indirectly reach and accumulate in the human body when the wastes are dumped into rivers.

(2 marks)

.....
.....
.....
.....

During oxidation of certain foods substances the respiratory quotient was found to be 0.718.

i) Name the type of food substance being oxidized. (1 mark)

.....
.....

ii) State **two** advantages of using the food substances named. (2 marks)

.....
.....

PROJECTION NO. 10

NAME:

INDEX NO:

SCHOOL.....

DATE.....

CANDIDATE'S SIGN.....

231/1

BIOLOGY

PAPER 1(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

.Write your **name**, **index number** and **school** in the spaces provided above.

Sign and write the date of examination in the spaces provided

Answer **all** the questions in the spaces provided

FOR EXAMINER'S USE ONLY

Question	Maximum score	Candidate's score
1-29	80	

Answer all questions in this section

1. Name the branch of Biology that involves the study of: (2mrks)

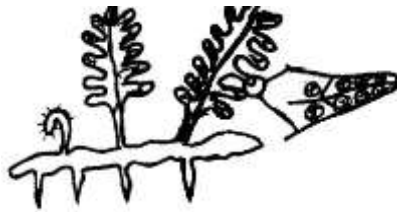
Organisms for the sake of classifying them.

.....

Microscopic organisms.

.....

The diagram below represents a plant



- a) Name the division to which the plant belongs. (1mrk)

.....

- b) Give **three** reasons for your answer in (a) above. (3mrks)

.....

.....

.....

3. State **three** parameters that can be used to estimate growth in seedlings. (3mrks)

.....

.....

.....

Equal amounts of crushed Irish potato was placed in equal volumes of hydrogen peroxide solution at indicated pH. The volume of the gas produced was measured and recorded as shown in the table below.

pH	4.0	7.0	9.0
Volume of gas (cm ³)	2.7	5.7	7.7

(a) Name the gas that was produced. (1mrk)

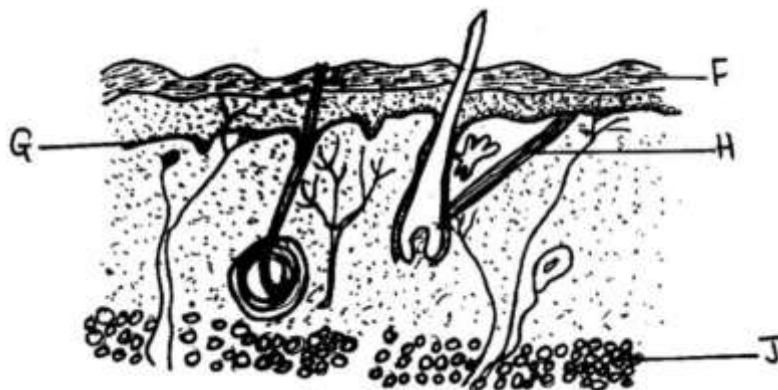
.....

(b) Account for the difference in the volume of the gas produced in pH 4.0 and pH 9.0 (2mrks)

.....

.....

The diagram below shows a longitudinal section of mammalian skin.



a) Name the parts labelled **F** and **G**. (2mrks)

F.....

G.....

b) State **one** function of each of the parts labelled **H** and **J**

(2mrks)

.....

.....

What are the names of modified leaves enclosing bougainvillea flowers whose function is to attract insect pollinators? (1mrk)

.....

.....

(a) A dog weighing 15.2kg requires 216kJ while a mouse weighing 50g requires 2736 kJ per day.

Explain.(2mrks)

.....

.....

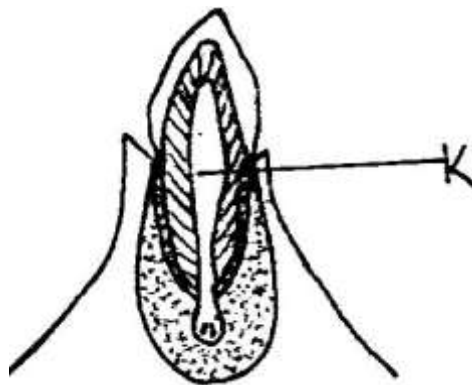
(b) Under what condition is lactic acid formed in human muscles?

(1mk)

.....

.....

The diagram below represents a section through a human tooth.



(a) Name the type of tooth shown.

(1mk)

.....

(b) Give a reason for your answer in (a) above.

(1mk)

.....

(c) State the functions of the structures found in the part labelled K.

(2mks)

.....

.....

.....

9. (a) State Darwin's theory of natural selection.

(1mk)

.....

.....

(b) State **two** advantages of divergent evolution to organisms.

(2mks)

.....

.....

.....

(c) What are vestigial organs?

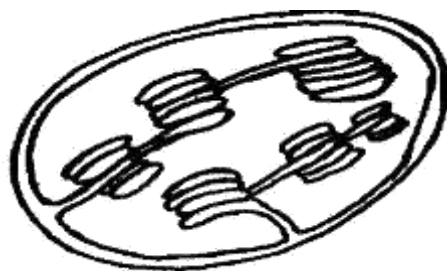
(1mk)

.....

.....

10 Below is a diagram of an organelle.

(2mks)



(a) State the function of the organelle drawn above. (1mk)

.....

(b) Name the parts of the organelle where :

(i) Oxygen gas is produced as a by product. (1mk)

.....

(ii) Carbon (IV) oxide is utilized. (1mk)

.....

11. (a) What is homeostasis? (1mk)

.....

.....

.....

.....

(b) State **three** processes in humans in which homeostasis is involved. (3mks)

.....

.....

.....

12. (a) Name the type of eye defect corrected by wearing convex lens. (1mk)

.....
(b) State **two** functions of iris. (2mks)

.....
.....

13.



(a) Identify the bone drawn above. (1mk)

.....

(b) Name the types of joint formed by the bone above. (2mks)

.....

.....

Name the parts of the human ear that perform the following functions.

(a) Amplifies sound vibrations. (1mk)

.....

(b) Balances air pressure between inner and outer ear. 1mk)

.....

(c) Contains hair cells to generate hearing impulses. (1mk)

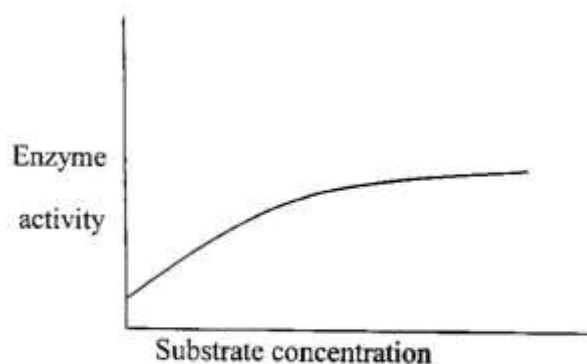
.....
15. (a) Why is the wall of the left ventricle thicker than that of the right ventricle. (1mk)

.....
.....

(b) State **three** adaptations of xylem to water transportation (3mks)

.....
.....
.....

15 Use the graph below to answer the following questions.



(a) Why does the activity of the enzyme become constant after a while? (1mk)

.....
.....

(b) State how the activity of the enzyme may be increased in (a) above. (1mk)

.....

.....

17. Describe capture - recapture method of estimating population. (3mks)

.....

.....

18 What is meant by self sterility with reference to flowers? (1mk)

.....

.....

19 Why do plants lack complex excretory system? (3mks)

.....

.....

20 How do herbaceous plants achieve support? Give **two**. (2mks)

.....

In a certain species of pea plants (*Pisum sativum*) the gene for yellow flowers is dominant over the gene for white flowers.

(a) Write the possible genotypes of a yellow flowered pea plant. (2mks)

(Use **R** for yellow flower gene)

.....

.....

.....

State how a yellow flowered pea plant can be confirmed to be heterozygous. (1mrk)

.....

.....

22. State the importance of active transport in living organisms. (3mrks)

.....

.....

.....

23. Why does carboxyhaemoglobin lead to death? (2mrks)

.....

.....

24. (a) Name **two** gaseous exchange sites in higher plants. (2mrks)

.....

.....

(b) State the difference between the amount of oxygen and carbon (IV) oxide that enters and leaves the human lungs (2mrks)

.....

.....

.....

.....

25. What causes apical dominance? (1mrk)

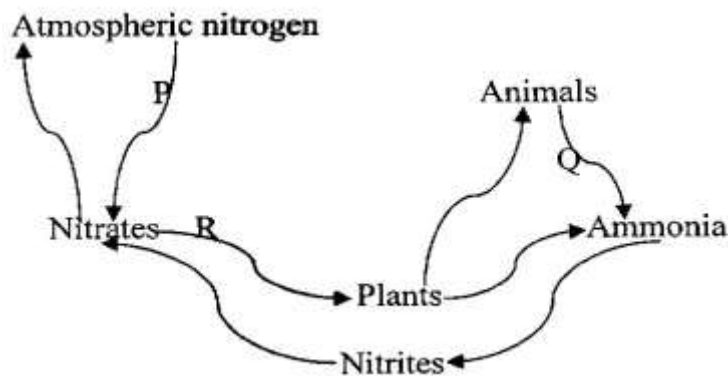
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.....

.....

The diagram below shows a simplified nitrogen cycle



- (a) Name the processes labelled **P**, **Q** and **R** (3mrks)

P.....

Q.....

R.....

27. State the biological importance of geotropism. (2mrks)

.....

.....

.....

28. Describe the type of chromosomal mutation known as translocation(1mrk)

.....

.....

.....

29. State **two** functions of ovaries in humans. (2mrks)

.....

.....

.....

PROJECTION NO. 11

NAME.....INDEX NO.....
SCHOOL..... DATE.....
SIGN.....

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

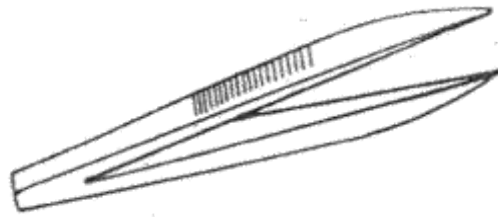
INSTRUCTIONS TO CANDIDATES

Answer all questions in the spaces provided

FOR EXAMINERS USE ONLY

Question	Maximum score	Candidates Score
1-24	80	

1. Identify the following apparatus and state its functions.



Name.....(1mark)

Function (1mark)

A student measured the length of a mitochondrion on a photomicrograph whose magnification was X 40000 and found it to be 1mm. Calculate the actual size of the mitochondrion. (3 marks)

.....

.....

.....

3. (a) Name the kingdom whose members have a cell wall made of chitin (2mark)

.....

.....

.....

(b) Besides the abdomen, name the other body part of the members of arachnida (1mark)

.....

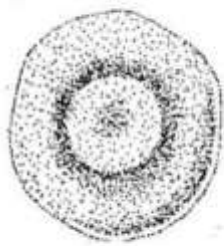
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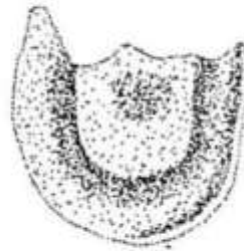
(c) State two main characteristic features of members of division Bryophyta (2 marks)

.....
.....
.....

4 A form one student obtained the results below in an experiment



Red blood cell
At start of experiment



Red blood cell
At end of experiment

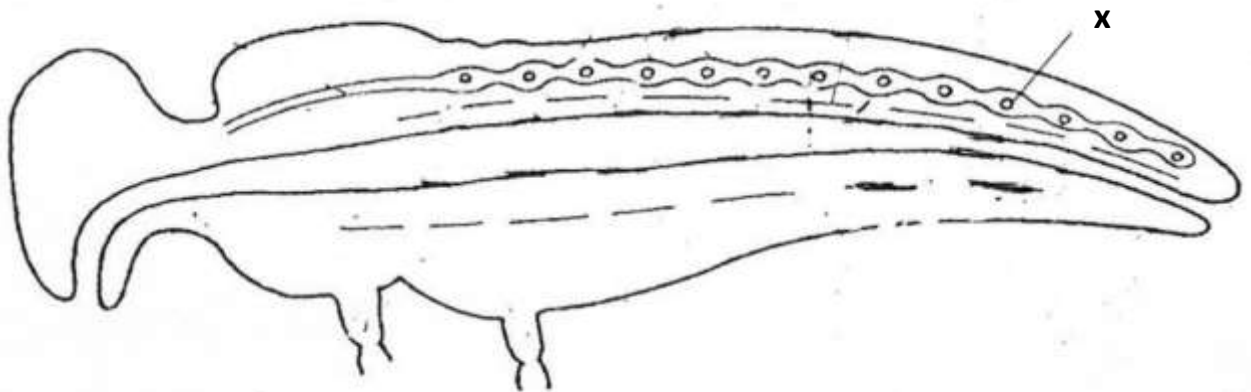
Identify the physiological process under investigation.
(1mark)

.....

(b) Account for the result obtained (3marks)

.....
.....
.....
.....
.....
.....

5(a) The diagram below illustrates the flow of blood in a certain organism. By use of arrows, show the direction of blood flow. (1mark)



Identify structure X.....
 .(1mark)

State 2 functions of haemolymph
 (2marks)

.....

A certain species of flowering plants relies entirely on sexual reproduction for propagation.
 The chromosome number of its Ovary tissue is 16. Predict the chromosome number in

(a)(i) Male nucleus
 (1mark)

.....

(ii) A cell of the endosperm

(1mark)

.....

.....

.....

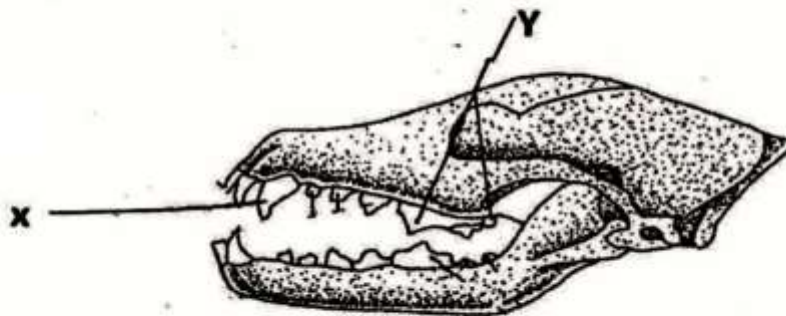
(b) How does the male nuclei reach the ovule after pollination (2marks)

.....

.....

.....

7 The diagram below represents dentition formula of a certain animal



Identify the parts labeled **X** and **Y** giving a function for each

X.....

Function.....(2marks)

Y.....

Function.....(2marks)

8 State **THREE** causes of seed dormancy (3marks)

.....

.....

.....

.....

9(a)

(i) Name the principal site of gaseous exchange in the lungs of humans (1mark)

.....

State 2 ways in which the structure named in (a) (i) above is adapted to its function (2marks)

.....

.....

.....

(b) Apart from gaseous exchange give one other function of stomata (1mark)

.....

.....

.....

The equations below represent certain reactions in living organisms.



(a) Name the reactions represented by the equations (2 marks)

(i).....

.....

(b) Calculate the RQ for the reaction (II) (2marks)

.....

.....

.....

(a) In a plant breeding experiment red flowered plants were crossed with white flowered plants.

Both plants were pure breeding. All F1 offspring's had pink flowers.
Give a genetic explanation for this occurrence (1mark)

.....

.....

.....

The words given in the table below are analogous to mutations. Fill in the table the type of mutation in each case
(2 marks)

	Intended	Actual	Mutation
(i)	From	Form	-----
(ii)	super	supper

(c) State ONE chemical agent that causes mutation (1mark)

.....

12 Explain what would happen if there is more water in the mammalian blood (4marks)

.....

.....

.....

.....

13 (a) List three evidences that support organic theory of evolution(3 marks)

.....

.....

.....

(b) Why is Larmack's theory of evolution not acceptable? (2marks)

.....

.....
.....

14 The diagram below represents a mammalian bone

Name the bone.....(1mark)

Name the type of joint formed by the bone at its anterior end **A** and the adjacent bone

.....(1mark)

(c) State the function of part labeled **B**. (1mark)

.....
.....

15 (a) In an accident, a victim suffered brain injury consequently the heart beat was affected.
Name the part of the brain which was injured. (1 mark)

.....

(b) Differentiate between simple reflex action and conditioned reflex action (2marks)

.....

.....

Explain why the carrying capacity for wild herbivorous animals is higher than that for cattle in a given piece of land.

(2marks)

.....

.....

.....

(b) Name the bacteria found in root nodules of leguminous plants (1mark)

.....

c) What is the role of the bacteria named in (b) above (1mark)

.....

.....

17 (a) In deamination, the amino group of the amino acid is normally removed to form ammonia. What happens to this ammonia? (1mark)

.....

.....

(b) State **Three** reasons why plants do not have a problem of excretion (3marks)

.....

.....

.....

18 (a) State where the light stage of photosynthesis process occur. (1mark)

.....

.....

(b) Give **TWO importances** of the light stage in photosynthesis (2marks)



.....
.....
.....

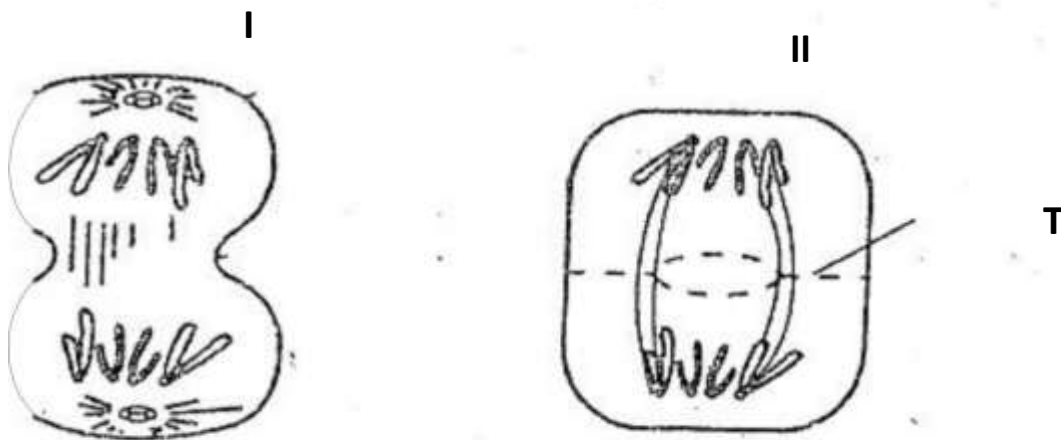
19 Name the three types of transpiration (3 marks)

.....
.....
.....
.....

20 Name **THREE** support tissues found in woody plants (3 marks)

.....
.....
.....

21 The figure below represents cytoplasmic division in animal cell and plant cell.



Identify the phase of cell division..... (1mark)

Name the structure labeled **T**.....(1mark)

c) Name the part of the plant from which the cell labeled **II** was obtained (1mark)

.....

22. The table below gives information about some diseases. Complete the table (4marks)

Disease	Type of organism causing the disease	Mode of transmission
1	Plasmodium Spp.	Bites by Anopheles mosquito
2. Amoebiasis		Ingestion
3. Cholera	Vibrio cholerae	
4. Typhoid	.	Taking in contaminated food or water

23. State one survival value of Nastic response (1mark)

.....
.....

24 (a) State the major effect of decrease of juvenile hormone (1mark)

.....
.....
.....

(b) Explain the meaning of the term instar (1mark)

.....
.....
.....

PROJECTION NO. 12

Name: Index No:

Candidate's Signature:.....

Date:

231/1

BIOLOGY

Paper 1

Time: 2 Hours

BIOLOGY

Paper 1

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES:

Write **your name** and **Index Number** in the spaces provided above.

Answer **all** the questions

All answers **must** be written in the spaces provided in this booklet.

Sign and write the date of examination in the spaces provided above.

Additional pages must **not** be inserted

Candidates should check the question paper to a certain that all the pages are printed as indicated and that no questions are missing.

EXAMINER'S USE ONLY

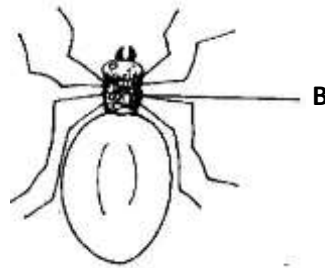
Question	Maximum score	Candidates score
1-32	80	

Answer all questions in the spaces provided after each question.

Name the bond that exists between amino acids during condensation process of forming proteins? (1mk)

.....

A student discovered the organism below moving about on the teacher's desk



(a) Name the class of which the organism belongs. (1mk)

.....

(b) Name the part labelled **B**. (1mk)

.....

A certain plant has the following characteristics: presence of roots, stems and the leaves, life cycle in saprophyte and gametophyte generation. Saprophyte generation being the dominant type. Name the division to which the plant belongs. (1mk)

.....

.....

State the biological significance of each of the following.

(a) Thick muscular walls and narrow lumen in arteries. (1mk)

.....

.....

(b) Narrow xylem vessels in flowering plants.

(1mk)

.....

5. What are **two** source of genetic diversity in meiosis ?

(2mks)

.....

.....

Explain why primary productivity decreases with depth in aquatic environment. (2mks)

.....

.....

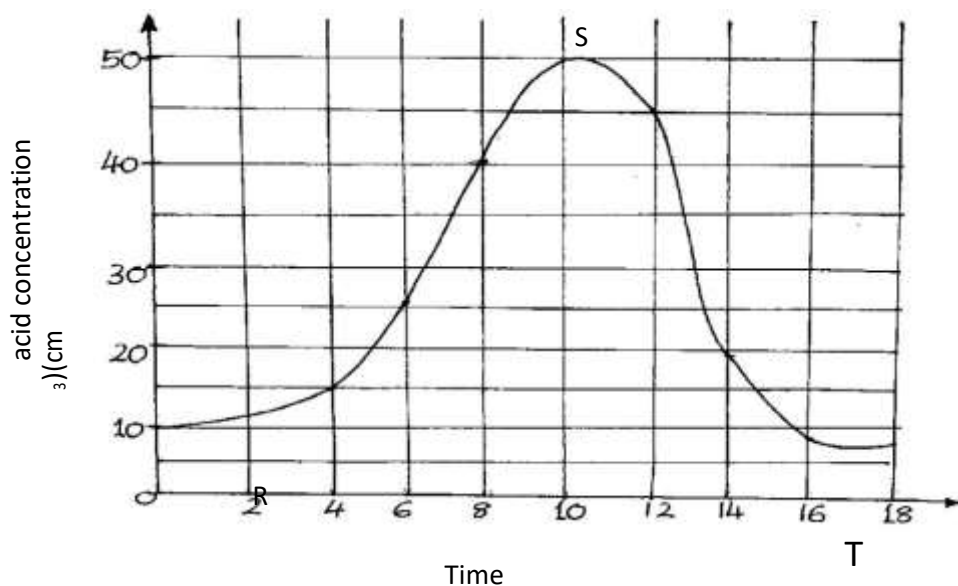
7. Name **two** regions in higher plants where cells actively undergo mitosis.

(2mks)

.....

.....

The diagram below shows the general appearance of lactic acid in the blood of an athlete after an exercise. Study it carefully and answer the questions that follow.



(a) Name the physiological process represented by the above diagram (1mk)

.....

Explain what was happening in the body between points: (2mks)

R and S

.....

S and T.....

.....

Name the class in the phylum arthropoda which has the larger number of individuals.

(1mk)

.....

A bone obtained from a mammal is represented by the diagram below.



(a) Name the bone (1mk)

.....

(b) Which bones articulates with the bone shown in the diagram at the notch?

..... (2mks)

11. (a) (i) What is meant by vestigial structures? (1mk)

.....

(ii) Give an example of a vestigial structure in any other organism other than human?

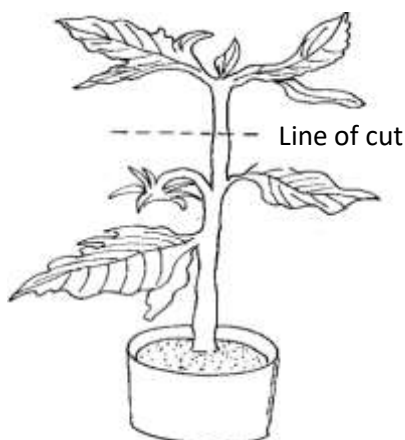
.....(1mk)

(c) Explain why certain drugs become infective in curing a disease after many years of use (2mks)

.....

.....

In an experiment the shoot tip of a young tomato plant decapitated as shown in the diagram below.



(a) State the expected results after 2 weeks (1mk)

.....

(b) Give a reason for your answer in (a) above (2mks)

.....

.....

State **three** structural differences between Deoxyribonucleic acid (DNA) and Ribonucleic acid (RNA) ?

.....

.....

.....

14. Explain why plants do not require specialized excretory organs. (3mks)

.....

.....

.....

Explain how the following factors affect the rate of photosynthesis

(a) Concentration of carbon (iv) oxide. (1mk)

.....

.....

(b) Light intensity (1mk)

.....

.....

Name **three** distinguishing characteristics that make man more developed and superior to all other mammals. (3mks)

.....

.....

17. State **two** advantages of cross-pollination. (2mks)

.....

.....

State the role of the following parts in the mammalian intestine

(a) Lacteal in the villi (1mk)

.....

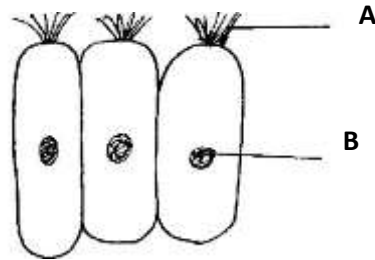
.....

(b) Goblet cells (1mk)

.....

.....

Study the figure below which shows a type of epithelial tissue



(a) State the name of structure **A**. (1mk)

.....

.....

(b) Give an example in humans where this epithelium is found (1mk)

.....

.....

A mother of blood group **AB** was married to a man of blood group **B**. What is the probability that one of their children would be blood group **A**. Show your workings. (3mks)

Name the substance in plasma and red blood cells that transport carbon (iv) oxide. (2mks)

(i) Plasma.....

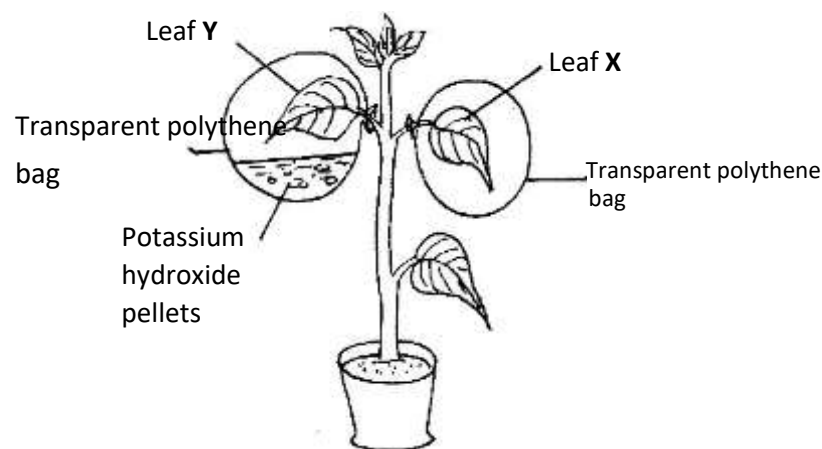
.....

Red blood cells

.....

.....

A potted plant was kept in dark for 48 hours. Two leaves **X** and **Y** were treated as shown in the diagram below.



The experimental set up was kept in the sunlight for 6 hours after which a starch test was carried out on the two leaves.

(a) What were the results of the starch test on leaves **X** and **Y**? (2mks)

.....

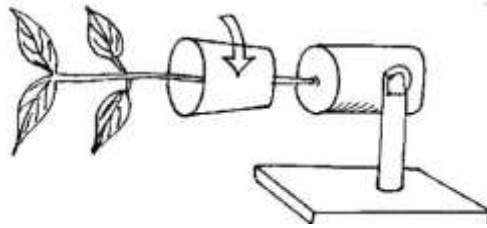
Y.....

(b) Give reasons for your answers in (a) above (2mks)

.....

.....

23. Carefully study the figure which rotates making one revolution in 15 minutes. A seedling with a straight radicle and plumule was attached to the apparatus as shown below.



(a) What is the name of the apparatus shown (1mk)

.....

(b) Make a drawing of how the seedling might have appeared after one week. (1mk)

24. (a) What is meant by the term non-disjunction? (1mk)

.....
.....

(b) Give an example of genetic disorders caused by:

(i) Non-disjunction (1mk)

.....

(ii) Gene mutation

.....

To estimate the population size of crabs in a certain lagoon, traps were laid at random, 400 crabs were caught, marked and released back into the lagoon. Four days later traps were laid again and 374 crabs were caught. Out of the 374 crabs, 80 were found to have been marked.

(a) Calculate the population size of the crab in the lagoon using the formula below:

$$N = \frac{n \times M}{m}$$

Where:

N = Total population of crabs in the lagoon

n= Total number of crabs in the second catch

M= Number of marked crabs during the first catch

m= Number of marked crabs in the second catch. (2mks)

(b) State the assumptions that were made during the observation (2mks)

.....

.....

(c) What is the name given to this method of estimating the population size (1mk)

.....

26. State the role of light in the process of photosynthesis. (1mk)

.....

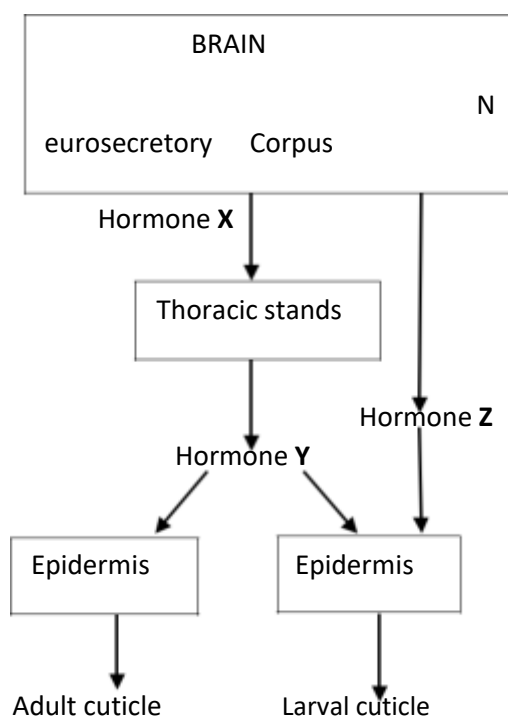
27. When are the **two** organisms considered to belong to the same species. (1mk)

.....

28. State the role of insulin in the human body (1mk)

.....

The chart below is a summary of the role of hormones in insect metamorphosis



(a) Name each of the hormones represented by letters **X** and **Y**. (2mks)

X.....

Y.....

(b) State the function of hormone **Z** (1mk)

.....

(c) What is the advantage of production of hormone **Y** alone without the secretion of hormone **Z**. (1mk)

.....

Give **two** ways in which the mammalian uterus becomes adapted to implantation of zygote (2mks)

.....

.....

31. A form one student trying to estimate the size of onion cells observes the following on the microscope's field of view. He counts 20 cells across the field of view which is 3mm.

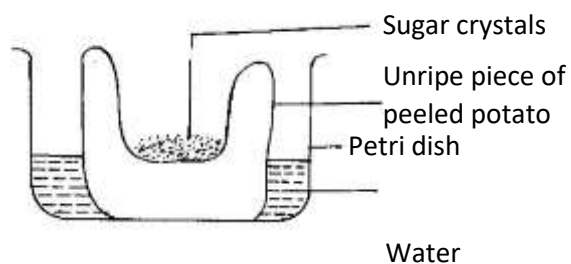
Calculate the size of one cell in micrometers. (3mks)

.....

.....

.....

An experiment to investigate a certain physiological process was set up as shown below. After three (3) hours it was observed that the level of the sugar solutions had risen.



(a) Name the physiological process being investigated? (1mk)

.....

.

(b) Account for the rise of the level of sugar solution in the experiment (3mks)

.....

.....

.....

.....

.....

.....

PROJECTION NO. 13

Name:.....Index. No.

Candidate's Signature..... Date:

231/1

BIOLOGY (THEORY)

Paper 1

TIME: 2 HOURS

Biology (Theory)

Paper 1

Time: 2Hours

INSTRUCTIONS TO CANDIDATES:-

Write your **name**, and **index Number** in the spaces provided above.

Answer **All** the questions in the spaces provided

Sign and write the date of examination in the spaces provided above.

FOR EXAMINER'S USE ONLY

Questions	Maximum score	Candidates score
1-29	80	

1. Name **two** sites of gaseous exchange in amphibians. (2mks)

.....
.....

2. State **two** roles of green plants in fish ponds other than providing food. (2mks)

.....
.....

3. Name **three** forces that maintain transpiration stream. (3mks)

.....
.....
.....
.....

Name the fins that prevent the following movements of fish during swimming. (3mks)

i)
Yawing.....

ii)

Pitching.....

iii)
Rolling.....

5.a) Name **two** disorders in humans caused by gene mutation. (2mks)

.....

.....

b) Describe the following chromosomal mutations; (2mks)

i)

Inversion.....

.....

ii)

Translocation.....

.....

State **three** reasons for loss of energy from one trophic level to another in a food chain. (3mks)

.....

.....

.....

.....

7.a) Name the part of the eye where image is formed. (1mk)

.....

b) State **two** characteristics of the image formed on the retina. (2mks)

.....

.....

8. Name a support tissue in plants that is thickened with cellulose. (1mk)

.....

State **two** functions of luteinizing hormone in reproduction. (2mks)

.....

.....

10. Give the meaning of the following terms.

(2mks)

i)

Protandry.....

.....

Self-sterility.....

.....

11.a) State the difference between ball and socket and hinge joint.

(1mk)

.....

.....

b) State the functions of synovial fluid.

(2mks)

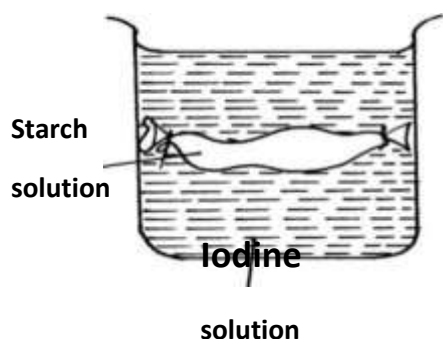
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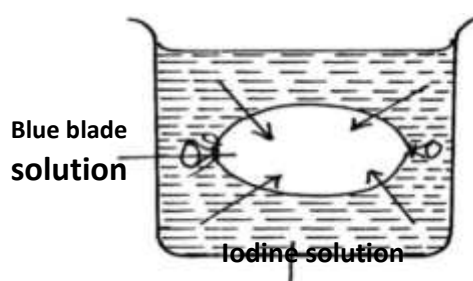
A group of students from Awasi Boys High School set up an experiment to demonstrate a certain

process. The experimental set up were as shown in the diagrams below.

Set – up 1



Set – up 2



After 10 minutes the students recorded their observation in a table as shown below.

	Observation	
	Inside the tube	Outside the tube
I	Blue black color	No color change
II	No colour change	Blue black colour

a) Name the process being demonstrated by this experiment. (1mk)

.....

b) Explain the result in the experiment set up I. (3mks)

.....

.....

.....

.....

13.a) Name the structures in phloem that are involved in the translocation of sugars. (2mks)

.....

.....

Other than sugars, name **two** compounds that are translocated in the phloem. (2mks)

.....

.....

14. State **four** ways in which the red blood cells are adapted to their function. (4mks)

.....

.....

.....

.....

15.a) What is oxygen debt? (1mk)

.....

.....

b) Give the differences in products of anaerobic respiration in plants and animals. (1mk)

.....

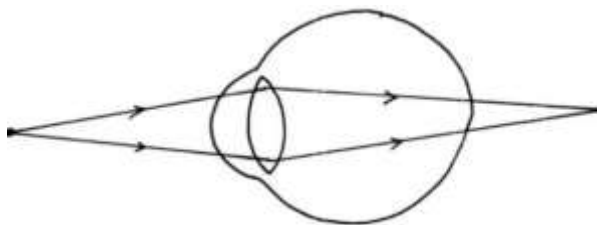
.....

State the aspects of light that affect the rate of photosynthesis. (2mks)

.....

.....

17. The diagram below shows the position of an image formed in a defective eye.



a) Name the defect.

(1mk)

.....

b) Explain how the defect named in (a) above can be corrected. (2mks)

.....

.....

.....

Explain continental drift as an evidence of evolution. (3mks)

.....

.....

.....

.....

19 .a)A certain animal has no incisors, no canines, 6 premolars and 6 molars in its upper jaw. It has 6 incisors, 2 canines, 6 premolars and 6 molars on the lower jaw. Write its dental formula. (1mk)

.....

.....

b) State the likely mode of feeding for the animal. (1mk)

.....

c) Give a reason for your answer in (b) above. (1mk)

.....

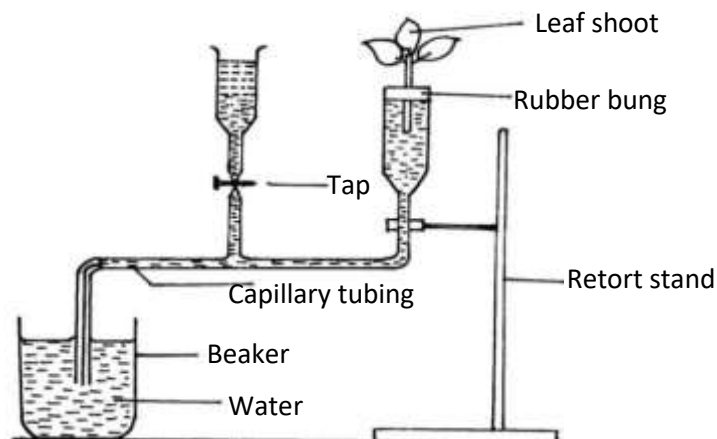
.....

20. State how the following structures of the skin are adapted to their functions; (3mks)

Malpighian layer.....

Sebacous
glands.....

A set up that was used to investigate a certain process in plants as shown in the diagram below.



a) What process was being investigated? (1mk)

b)i) State **two** precautions that should be taken when setting up the experiment. (2mks)

ii) Give a reason for each precaution stated in b(i) above. (2mks)

22. State the functions of;

a) Ribosomes.

(1mk)

.....

b) Golgi apparatus

(2mks)

.....

.....

What is meant by the terms;
(2mks)

a)
Allele.....

.....

Test-cross.....

.....

24. Give the difference between Darwinian and Larmackian theories of evolution. (2mks)

.....

.....

25.a) How is the starch utilized by the seedling? (3mks)

.....

.....

.....

b) Name the hormone that is responsible for fruit ripening.

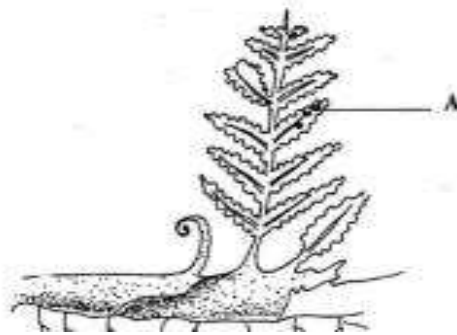
(1mk)

.....

.....
26. Give the meaning of the term **binomial nomenclature**.

(1mk)

.....
.....
27. Wanganga students collected the plant shown below during an education trip.



a) Name the part labelled **A**.

(1mk)

.....
b)i) State the division to which the plant belongs.

(1mk)

.....
ii) Give **two** reasons for the answer in b(i) above.

(2mks)

.....
28. Name the causative agents of the following diseases in humans.

(2mks)

i) Candidiasis

.....
ii) Cholera

.....
29. State the form in which energy is stored in muscles. (1mk)
.....

PROJECTION NO. 14

Name:Index No:

School: Candidate's name

Date:

231/1

BIOLOGY

Paper 1

Time: 2 Hours

BIOLOGY

Paper 1

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES:

Write **your name** and **Index Number** and **School** in the spaces provided above.

Answer **all** the questions in this question paper.

Answers **must** be written in the spaces provided in this booklet.

EXAMINER'S USE ONLY

Question	Maximum score	Candidate's score
1	20	
2	25	
3	20	
4	15	

Answer all the questions in the spaces provided.

1 State the role of light in photosynthesis (1mk)
.....
.....

2. Name **two** functions of sodium in human body (2mks)
.....
.....
.....

3. List down the processes responsible for ; (2mks)

The formation of glomerular filtrate
.....
.....
.....

Absence of glucose and amino acids in urine.
.....
.....

4. (a) State the functions of the following parts in a cell (2mks)
Nucleolus
.....
.....
.....

Smooth endoplasmic reticulum
.....
.....
.....

(b)Name an organelle that would be found in large numbers in cells of secretory glands (1mk)

.....

.....

5. Identify the use of the following apparatus (3mks)

Bait trap

.....

.....

.....

Specimen bottle

.....

.....

Pitfall trap

.....

.....

6. (a) Why is osmosis regarded as a special case of diffusion (1mk)

.....

.....

(b) List down two importance of active transport in animals (2mks)

.....

.....

.....

7. (a). Define the term allele 1mk)

.....

.....

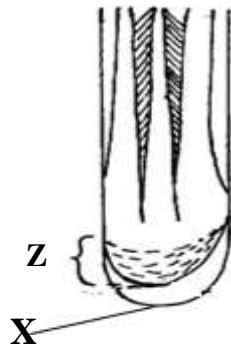
(b) Differentiate between a dominant gene and a recessive gene (2mks)

.....

.....

.....

8 Study the diagram below and answer the following questions.



(a) (i) Identify the part labelled X (1mk)

.....

.....

.....

(iii) State the function of part X above (1mk)

.....

.....

.....

List down **two** characteristics of cells in the region labelled Z
(2mks)

.....

.....

.....

.....

.....

9(a) What is meant by the following terms; (2mks)

(i) Ecosystem

.....

.....

.....

.....

(ii) Carrying capacity

.....

.....

.....

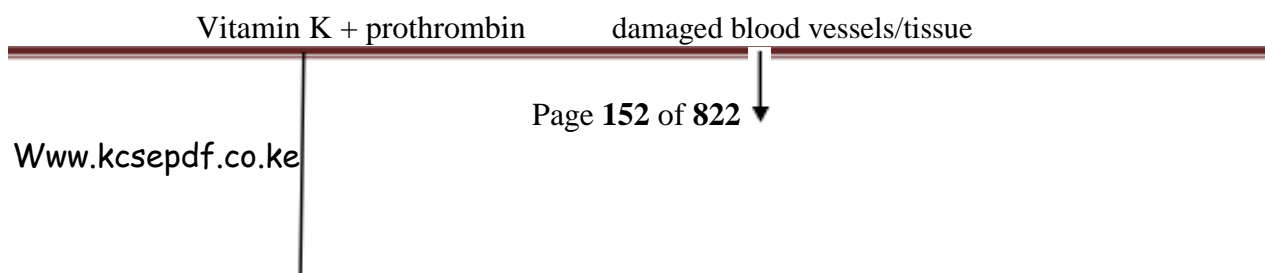
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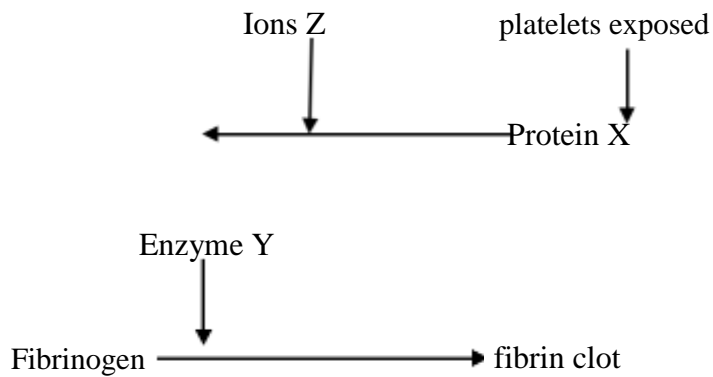
Give **two** ways on how hydrophytes are adapted to the process of gaseous exchange (2mks)

.....

.....

The scheme below illustrates the blood clotting process;





(a) Identify the following;

(2mks)

(i) Protein X

.....

(ii) Enzyme Y

.....

(b) State down the role of ions Z in the scheme above (1mk)

.....

(iii) Name a trait in humans determined by multiple alleles

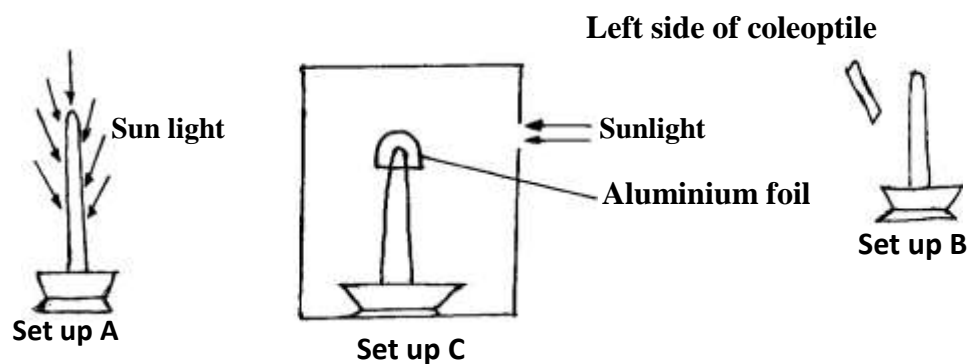
(1mk)

.....

Oat coleoptiles were used in the experiment set ups shown below. Study the set-ups and answer

The following questions.

Glass rod with IAA brushed on the



What type of response was being investigated above? (1mk)

.....

(b) Which of the set up above would act as a control experiment? (1mk)

.....

(c) Explain what happened in set up B after 24 hours (2mks)

.....

.....

.....

.....

12. The equation below represents a process in a mammalian liver



(a) Name the process shown by the equation above (1mk)

.....

.....

(b) List down a carbohydrate that is;-

(i) Stored in the mammalian liver (1mk)

.....

.....

(ii) Found in abundance in mammalian blood (1mk)

.....

13. a) Distinguish between homologous structures and analogous structures (2mks)

.....

.....
b) State a major shortcoming in Jean Baptiste de Lamarck's theory of evolution (1mk)

..... 14.
a) List down **two** differences between closed and open circulatory systems (2mks)

.....
b) Name **two** ways in which heart muscles are special (2mks)

.....
15. a) State **two** physiological mechanisms of controlling the human body temperatures during a hot day (2mks)

.....
b) Name **two** ways in which loop of henle is adapted to its function (2mks)

.....
16. a) State the function of Juvenile hormone in insect metamorphosis (1mk)

.....
b) Give a reason why most insects are serious crop pests at the larval stage (1mk)

.....
(ii) What happens at growth phase in insects growth curve (1mk)

.....

.

What are the effects of releasing excess nutrients into lake Naivasha by the nearby flowers farms?(3mks)

.....

.....

.....

.....

18. State **three** ways how HIV and AIDS is transmitted in human population (3mks)

.....

.....

.....

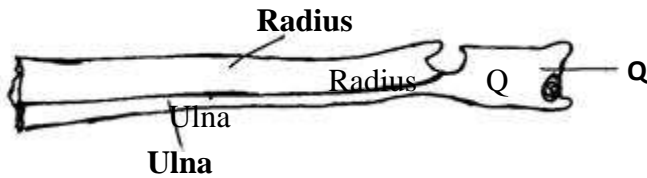
List **three** characteristics that distinguish arthropods from organisms in kingdom Monera (3mks)

.....

.....

.....

Study the bones below and answer the questions that follow;



(a) Identify the function of the part labeled **Q** (1mk)

.....

.....

(b) Name the bone that articulates with the bone above at the proximal end (1mk)

.....

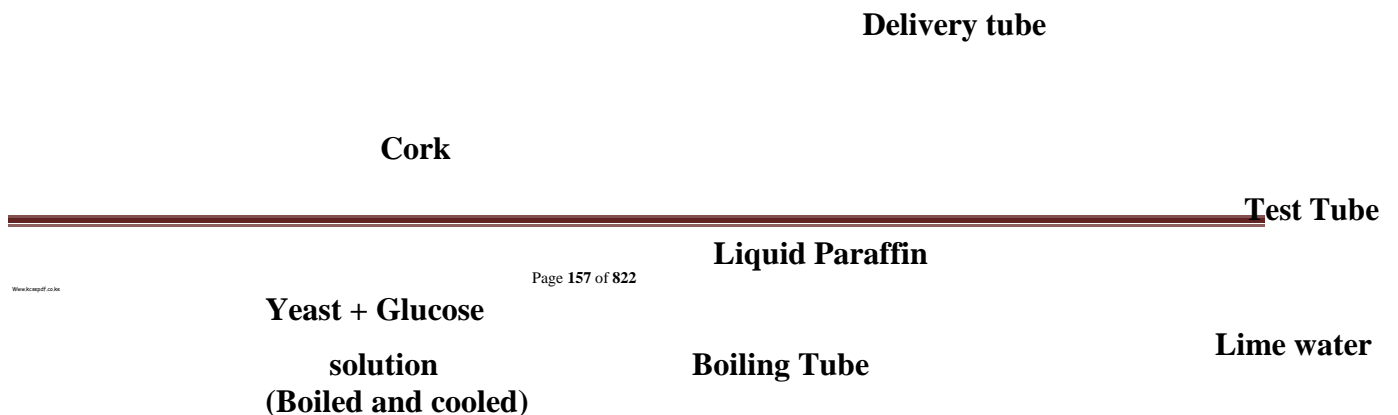
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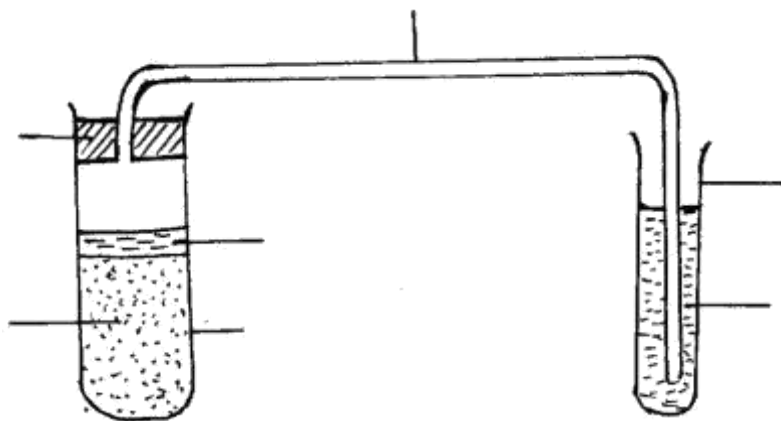
(c) List down **two** types of support tissue in plants (2mks)

.....

.....

21. Form two students set up an experiment as shown in the diagram below;





(a) Which process was being investigated? (1mk)

.....

(b) Why was it necessary to boil the glucose solution? (1mk)

.....

Write a word equation representing the chemical reaction taking place above in the boiling tube(1mk)

.....

22. Name **two** types of active immunity (2mks)

.....

State how the following parts of the mammalian ear are adapted to their functions. (3mks)

Pinna.....

Eardrum.....

Cochlea.....

24. (a) A passenger was involved in a road accident. He couldn't move his limbs and neck.

Which part of the brain was affected?

(1mk)

.....

.....

(b) (i) State **two** functions of cerebrospinal fluid.

(2mks)

.....

.....

.....

State the importance of breathing through the nose than through the mouth . (2mks)

.....

.....

.....

26. a) Identify the type of asexual reproduction exhibited by yeast cells

(1mk)

.....

b) List down the functions of the following parts;

(3mks)

i)

Testis.....

ii) Fallopian tube.....

iv) Urethra.....

PROJECTION NO. 15

Name:

Index No.

School:.....

Candidate's Signature.....

Date:

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:-

Write your **name**, **index number** and **school** in the spaces provided.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

For Examiner's Use Only

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-29	80	

1. Insects blood is noted to lack a respiratory pigment. Explain (1mk)

.....

State the functions of the following parts of a nephron

- (i) Loop of Henle (1mk)

.....

- (ii) Distal convoluted tubule (1mk)

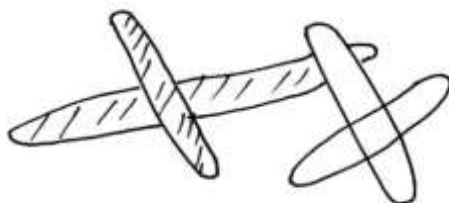
.....

2. Most terrestrial plants do not grow well in waterlogged soils.

Give a reason for this (1mk)

.....

The diagrams below show a pair of homologous chromosomes. Study them and answer the questions that follow



- (i) State the phenomenon shown above (1mk)

.....

- (ii) What is the genetic significance of the phenomenon above? (2mks)

.....

.....

5. Give two destinations of food translocated from the leaves of plants. (2mks)

.....

.....

Name the organelle that is likely to be found in abundance in:

- (a) an enzyme secreting cell (1mk)

.....

- (b) Cells producing lipid related secretions (1mk)

.....

- (c) Areas where the cells have ruptured (1mk)

.....

A small boy remarked that his dog looks larger on cold days than on hot days. Give a biological explanation for this (2mks)

.....

.....

The table below show the percentage composition of carbon (IV) oxide and oxygen inhaled and exhaled air

Gases	Inhaled air	Exhaled air
Oxygen	20%	17%
Carbon (IV) oxide	0.04%	4.0%

- (a) explain the differences in the percentage of the two gases in inhaled and exhaled air (2mks)

.....

.....

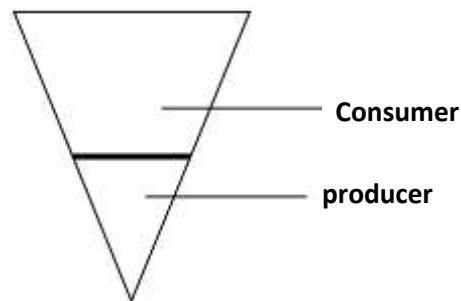
(b) Carbon (IV) oxide

(2mks)

.....

.....

The diagram below represents a pyramid of biomass derived from a certain ecosystem



(a) Suggest the type of ecosystem from which the pyramid was derived

(1mk)

.....

.....

(b) State the significance of short food chains in an ecosystem

(1mk)

.....

10. State two features of atoms that increase the rate of impulse transmission

(2mks)

.....

.....

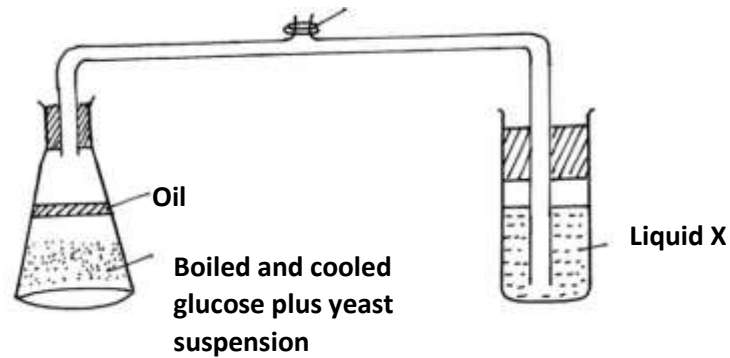
11. Distinguish precisely between diabetes mellitus and diabetes insipidus

(2mks)

.....

.....

The set up below shows apparatus to demonstrate a certain biological process



(a) What biological process was being investigated in the experiment (1mk)

.....
.....

(b) Write down a word equation that represents the reaction above (1mk)

.....
.....

(c) In the above set up, why was it important to boil and cool glucose before adding yeast (1mk)

.....
.....

Explain how the following occur during gene mutation

(i) Substitution (2mks)

.....
.....

(ii) Insertion (2mks)

.....
.....

14. (a) What are meristems? (1mk)

.....
.....
(b) (i) What is the role of cork-cambium in secondary growth? (1mk)

.....
.....
(ii) Name the meristem that is responsible for increase in length of stems (1mk)

.....
.....
15. State **two** functions of the spleen (2mks)

.....
.....
Name the excretory products eliminated by the following animals

(i) Tilapia (1mk)

.....
(ii) Chicken (1mk)

.....
State the functions of the following parts of the human ear

(a) Ossicles (1mk)

.....
.....
(b) Pinna (1mk)

.....
Name the causative organism of the following diseases

(i) Malaria (1mk)

.....
.....
(ii) Bilharzia (1mk)
.....
.....

Identify the part of the light microscope which serve each of the functions described below

(i) Making rough focus (1mk)
.....

(ii) Reflecting light from the source (1mk)
.....

20. State **two** characteristics of aerenchyma tissue (2mks)
.....
.....

21. What is the significance of transpiration in plants? (3mks)
.....
.....
.....

22. State **two** ways in which xylem vessels are adapted to their functions (2mks)
.....
.....

23. Distinguish between convergent and divergent evolution (1mk)
.....

State the characteristics that distinguish the following organisms into their respective classes
(3mks) Millipedes, spider and tse tse fly
.....

.....

.....

How do identical twins and fraternal twins arise?

(i) Identical twins

(2mks)

.....

.....

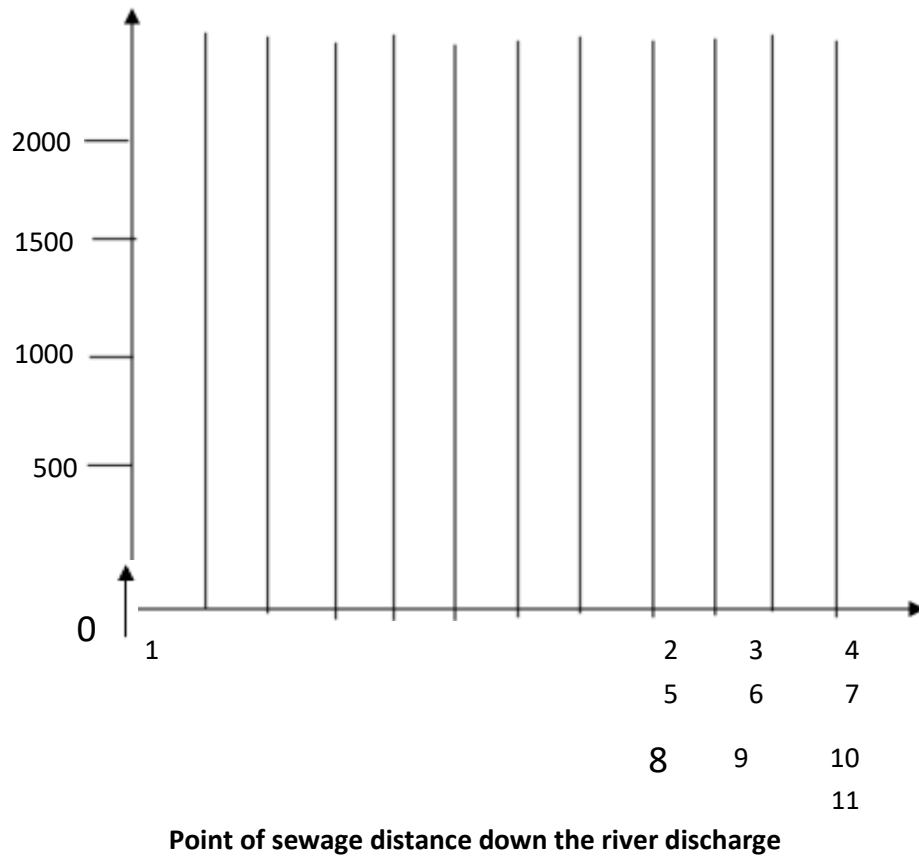
Fraternal twins
(2mks)

.....

.....

The graph below is of sewage on the population of a species of bacteria in a certain river





Account for the changes in population of bacteria between 2 and 10 kilometers down the river (2mks)

.....

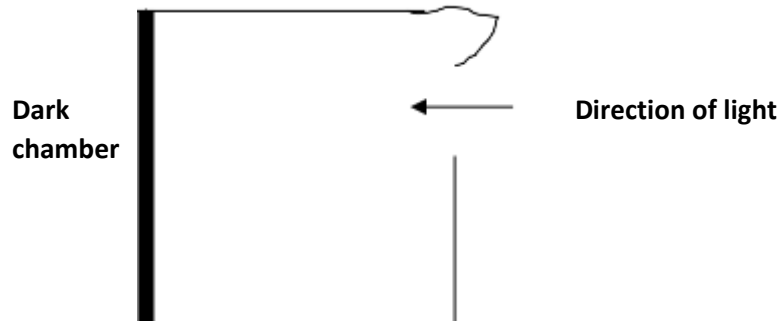
.....

Distinguish between interspecific and intra-specific competition (2mks)

.....

.....

The diagram below shows a tip of a plant coleoptile with light coming towards it from one side



(a) How would the plant respond to light?

(1mk)

.....

.....

(b) Give the name of such response

(1mk)

.....

.....

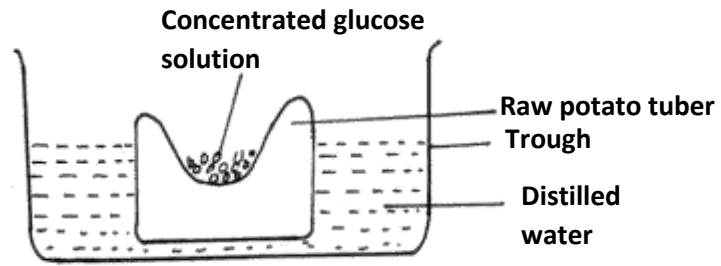
(c) What is the advantage of plants responding in this way?

(2mks)

.....

.....

The experiment illustrated below was set up to investigate a certain physiological process using a raw tuber



(a) Suggest a possible physiological process that was being investigated (1mk)

.....

.....

(b) Explain the results obtained in the above experiment after a few hours (2mks)

.....

.....

(c) State the observations that would have been made if the experiment was repeated using boiled potato (2mks)

.....

.....

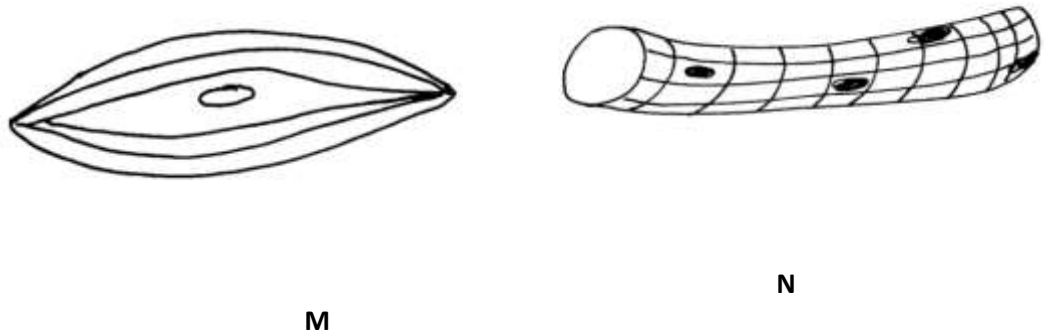
.....

29. (a) Give **two** functions of blood as a tissue (2mks)

.....

.....

(b) The figure below illustrate specialized cells in an animal body



(i) Identify the cells M and N

(2mks)

.....

.....

(ii) State the structural differences between M and N

(2mks)

.....

.....

(iii) Which of the above specialized cells is found in the gut?

(1mk)

.....

.....

PROJECTION NO. 16

NAME:

INDEX NO:

SCHOOL: DATE:

CANDIDATE'S SIGN:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

BIOLOGY

Paper 1

INSTRUCTIONS TO CANDIDATES:

Write **your name** and **Index Number** and **School** in the spaces provided above.

Answer **all** the questions

All answers **must** be written in the spaces provided in this booklet.

Sign and write the **date** of examination in the spaces provided above.

Additional pages must **not** be inserted

Candidates should check the question paper to a certain that all the pages are printed as indicated and that no questions are missing.

EXAMINER'S USE ONLY

Question	Maximum score	Candidates score
1-31	80	

1. Name the type of circulatory system found in the phylum Arthropoda (1mks)

.....

2. State the areas of the plant where translocated materials are taken (2mks)

.....

3. (a) Name the component of a person's diet that is essential for peristalsis (1mk)

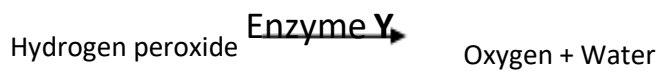
.....

- (b) Give **two** groups of food which are reabsorbed along the mammalian digestive system without undergoing digestion. (2mks)

.....

.....

The reaction represented by the equation below occurs in the body.



- (a) Name enzyme Y. (1mk)

.....

- (b) Name an organ in the body where the reaction occurs. (1mk)

.....

.....

What do you understand by the following terms

- (a) Anatomy (1mk)

.....

- (b) Biochemistry (1mk)

.....

State the functions of the following parts of a cell

(a) Ribosome(1mk)

.....

.....

State the role of the following parts of the skin

(a) Cornified layer

(1mk)

.....

(b) Malpighian layer

(1mk)

.....

.....

8. Name the blood vessel that nourishes the heart

(1mk)

.....

.....

9. (a)Name **two** disorders in man that occur through gene substitution

(2mks)

.....

.....

(b) Give **two** advantages of polyploidy in plants.

(2mks)

.....

.....

10. (a) Explain what is meant by the term oxygen debt in human beings.

(1mk)

.....

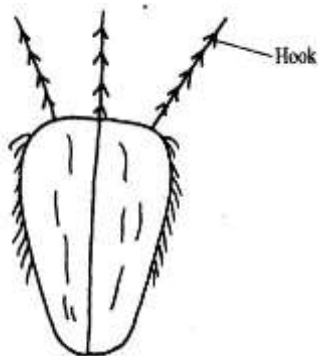
(b) What are the end products of anaerobic respiration in animals.

(2mks)

.....

.....

The diagram below represents a mature fruit from a dicotyledonous plant, observe it and answer questions that follow.



(a) To what group of fruits does the specimen belong? (1mk)

.....

(b) Suggest the possible agent of dispersal of the fruit

(1mk)

.....

12. Explain why menstrual periods stops immediately after conception?

(3mks)

.....

.....

.....

.....

13. (a) Why is sexual reproduction important in evolution of plants and animals

(1mk)

.....
.....
(b)The calyx cells of a certain plant has 22 chromosomes. State the number of chromosomes present in plants

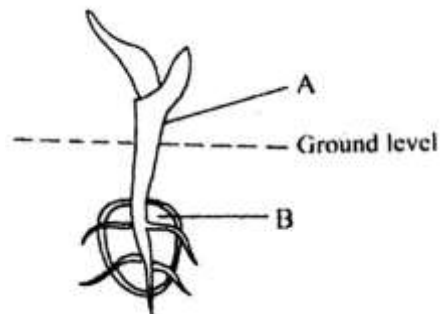
(i)Endosperm

.....
.....
(ii)Ovule cell

(2mks)

14. Explain why sweat accumulates on a person's skin in a hot humid environment. (2mks)

.....
.....
The diagram below represents a maize seedling



(a) (i) Name the type of germination exhibited by maize (1mk)

.....
(ii) Give a reason for your answer in (a)(i) above. (1mk)

.....

(b) State the functions of the parts labelled **A** and **B**. (2mks)

.....

B.....

State the role played by the following substance in digestion.

(i)Hydrochloric acid (2mks)

.....

.....

(ii) Bile salts

.....

State how the following factors control population.

(i) Predation(1mk)

.....

.....

(ii)Competition

.....

18. Give **three** importance of mammalian skeleton. (3mks)

.....

.....

19. State **two** advantages of a metamorphosis in the life of insects. (2mks)

.....
.....
.....

State the functions of the following structures of the mammalian ear

(a) Eustachian tube (1mk)

.....

(b) Ossicles

.....

(a) John and Becky who are siblings are both normal as their parents but have a haemophilic brother. Give the genotype of their parents. (2mks)

.....
.....

(b) What are linked genes? (2mks)

.....
.....

22. State **two** adaptation of alveolus to its functions. (2mks)

.....

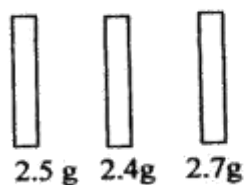
23. (a) What are the analogous structures? (1mk)

.....

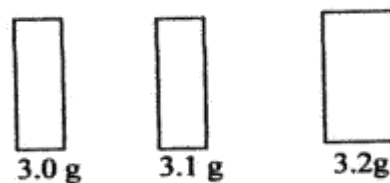
(b) Give **two** examples of homologous structures. (2mks)

.....
.....

Potato cylinders were weighed and kept in distilled water overnight. They were then reweighed.



At the beginning of the experiment



At the end of the experiment

(a) Calculate the average mass of the potato cylinders after reweighing. Show your working.

(2mks)

.....

.....

(b) Explain why mass of cylinders had increased. (2mks)

.....

.....

25. (a) In which form is oxygen transported in blood. (1mk)

.....

.....

(b) Why do plants not take in oxygen during the day although they need it for respiration. (1mk)

.....

.....

26. (a) Distinguish between conditioned and simple reflexes. (2mks)

.....

.....

(b) State how the nerve cell structure is suited to its function of impulse transmission. (2mks)

.....

.....

.....

27. State **two** factors that hinder self-pollination and fertilization. (2mks)

.....

.....

.....

Name joints formed between the:

(a) Humerous and scapula. (1mk)

.....

(b) Cranial bones. (1mk)

.....

State the effects of the following plant growth hormones

(i) Gibberrellins (1mk)

.....

.....

(ii) Absciscic Acid (1mk)

.....

.....

Name support tissues in plants thickened with:

(a) Cellulose

(1mk)

.....

.....

(b) Lignin

(1mk)

.....

.....

31. State **three** biological importance of tropisms in plants. (3mks)

.....

.....

.....

.....

.....

PROJECTION NO. 17

NAME: INDEX NO:

SCHOOL DATE:

CANDIDATE'S SIGNATURE.....

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES:

Write **your name** and **Index Number** and **School** in the spaces provided above.

Answer **all** the questions

All answers **must** be written in the spaces provided in this booklet.

Sign and write the date of examination in the spaces provided above.

Additional pages must **not** be inserted

Candidates should check the question paper to a certain that all the pages are printed as indicated and that no questions are missing.

EXAMINER'S USE ONLY

Question	Maximum score	Candidates score
1-28	80	

State the functions of each of the following cell organelles.

(a) Lysosomes

.....

.....

(b) Golgi apparatus

.....

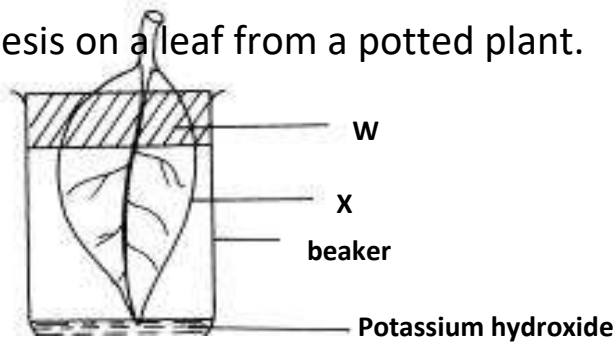
.....

Give any **two** factors that hinder self-fertilization in flowering plants.(2marks)

.....

.....

The diagram below shows an experiment that was carried out to investigate photosynthesis on a leaf from a potted plant.



The plant was kept in the darkness for 48 hours before the experiment. The set-up was left in the light for several hours, and then the leaf was tested for starch.

(a) What results was expected in region: (2mks)

.....

.....

W.....

.....

State the role of potassium hydroxide in the experiment. (1mark)

.....

.....

4. (a) What is sex-linkage. (1marks)

.....

.....

(b) Name **two** sex linked traits in humans. (2marks)

.....

.....

Give **three** ways in which red blood cells are adapted to carrying out their function. (3marks)

.....

.....

.....

Explain the importance of each of the following during the process of digestion in human beings.

Bile(1mk)

.....

.....

(b) Saliva

(2mks)

.....

.....

7. What changes would occur to a marine amoeba species if it was transferred into a fresh water pond? (2mks)

.....

.....

Distinguish between analogous and homologous structures. (2marks)

.....

.....

.....

(a) State **one** function of cilia in organisms. (1mark)

.....

.....

(b) Name **two** parts of the human body which have cilia. (2marks)

.....

.....

John and Paul, who are siblings, are both normal and so are their parents, but they have a haemophilic brother. Give a genotype of their parents (2marks)

.....

.....

11. The diagram below represents the mature fruit of a certain plant.



(a) State the agent of dispersal for the fruit. (1mark)

.....

.....

(b) Give **one** reason for your answer in (a). (1mark)

.....

.....

(c) State **one** advantage of fruit and seed dispersal. (1mark)

.....

.....

In the experiment, it was observed that when maggots are exposed to light, they move to dark areas, while *Euglena* and *Chlamydomonas* move towards the light.

(a) Name the type of response exhibited by:

(i) Maggots (1mark)

.....

.....

(ii) *Euglena* and *Chlamydomonas* (1mark)

.....

.....

(b) State the importance of the response shown by:

(i) Maggots (1mark)

.....

.....

(ii) *Euglena* and *Chlamydomonas* (1mark)

.....

.....

(a) Name the hormone responsible for apical dominance in plants.
(1mark)

.....

.....

(b) Aldosterone is a hormone involved in homeostasis.

(i) Name the gland that produces aldosterone. (1mark)

.....

.....

(ii) State the function of aldosterone. (1mark)

.....

.....

(a) Name the process by which urea is formed in the liver. (1mark)

.....

.....

(b) Explain the importance of excreting urea from the body. (1mark)

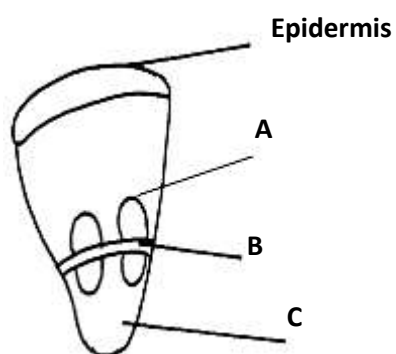
.....

.....

(c) Young growing children excrete less nitrogen compared to what they consumed. Explain. (1mark)

.....
.....

15. The diagram below shows a section of a dicotyledonous stem.



(a) Name the parts marked: (2mark)

A.....

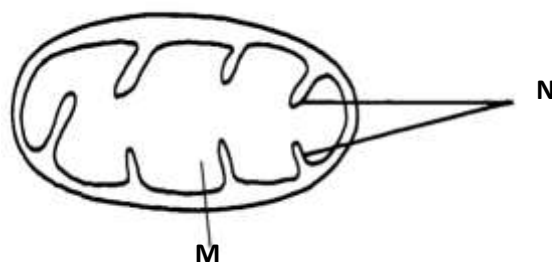
C.....

(b) State the function of the part marked **B**. (1mark)

.....
.....

Study the diagram of a cell organelle shown below and answer the questions that follow.

Name the parts labelled **M** and **N**.



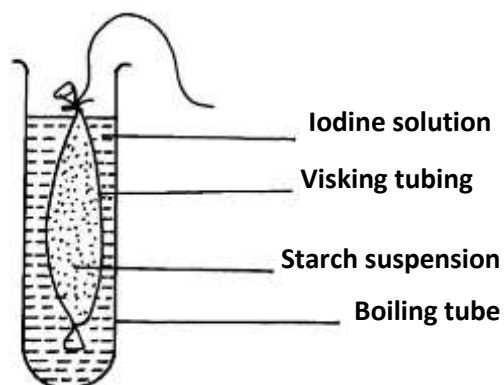
M.....(1mark)

N.....(1mark)

(b) State the function of the organelle. (1mark)

.....
.....

17. Study the diagram below.



What colour is expected in the visking tubing and iodine solution after sometime?

(i) In visking tubing. (1mark)

.....

.....

(ii) Iodine solution (1mark)

.....

.....

(b) Explain the observation in iodine solution. (1mark)

.....

.....

18. Name **three** support tissues in higher plants. (3marks)

.....

.....

.....

What is the function of aerenchyma tissue in hydrophytic plants?

(2mark)

.....

How is the alveolus of a mammal adapted for gaseous exchange?

(3marks)

.....

.....

(a) Name the organisms that cause the following diseases.

(i) Malaria (1mark)

.....

(ii) Cholera (1mark)

.....

(b) State **one** way of controlling schistosomiasis (bilharzia)

.....

.....

22. What is the importance of:

(i) Primary growth

(1mark)

.....

.....

(ii) Secondary growth

(1mark)

.....

.....

23. State **three** adaptations of sperm to its function.

(3marks)

.....

.....

.....

24. What is the importance of the following in plant nutrition.

(a) Root hairs

(1mark)

.....

.....

(b) Stomata

(1mark)

.....

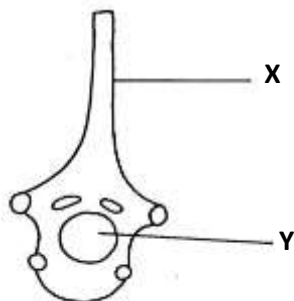
.....

(c) Xylem (1mark)

.....

.....

25. The diagram below represents the structure of a mammalian vertebra.



(a) Identify the vertebra. (1mark)

.....

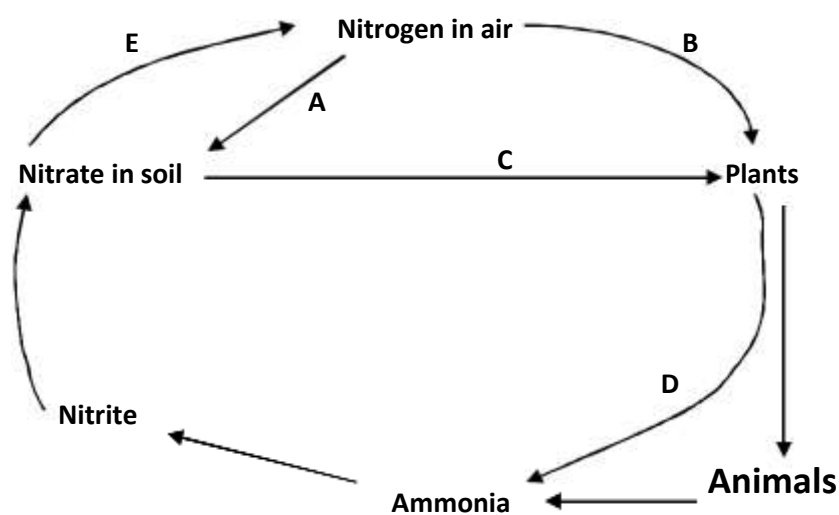
.....

(b) Name the parts labelled **X** and **Y**.

X (1mark)

Y..... (1mark)

26. The figure below represents the cycling of nitrogen in nature.



(a) Name the process represented by letters (3marks)

A.....

C.....

E.....

(b) Name the organisms responsible for process **B**. (1mark)

.....

What are the economic importance of organisms in kingdom fungi.(3marks)

.....

.....

.....

State **three** evidences that support the theory of evolution.
(3marks)

.....

.....

.....

PROJECTION NO. 18

NAME..... INDEX NO.....

SCHOOL..... CANDIDATE'S SIGNATURE.....

DATE.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **Index Number** and **School** in the spaces provided above.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1-22	80	

1. (a) Define the term 'parthenocarpy'. (1mk)

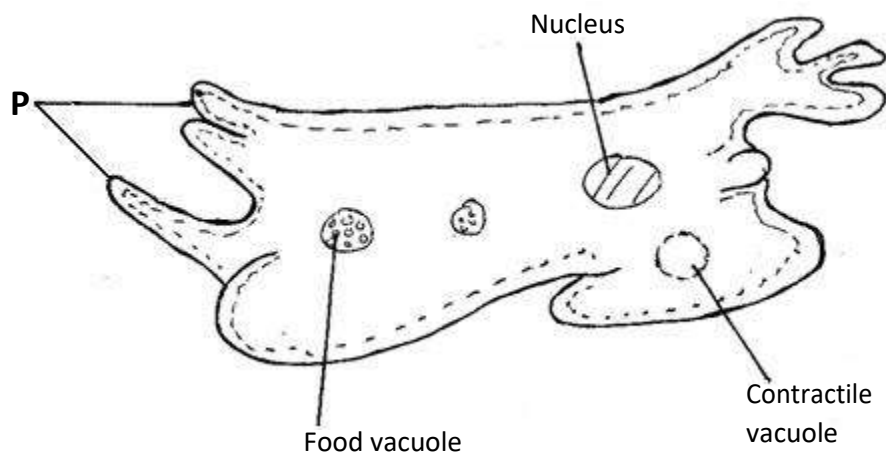
- (b) Name **two** plant growth hormones that promote parthenocarpy. (2mks)

Name the organelle that performs each of the following functions in a cell

- (i) Protein synthesis. (1mk)

- (ii) Transport of cell secretions. (1mk)

The diagram **below** represents a certain organism.



(a) Identify the kingdom to which the organism belongs. (1mk)

(b) Identify the part labeled **P**. (1mk)

(c) What is the function of contractile vacuole? (1mk)

4. Other than carbon (IV) oxide, name other products of anaerobic respiration. (2mks)

5. (a) Name the fluid that is produced by sebaceous glands. (1mk)

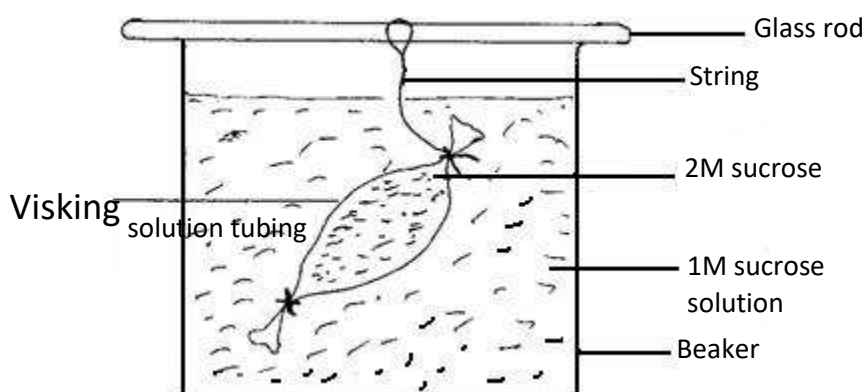
(b) State **two** functions of sweat on the human body. (2mks)

(a) State **two** characteristics that are used to divide the phylum arthropoda into classes.
(2mks)

(b) Name the class with the largest number of individuals in the phylum arthropoda.
(1mk)

7. Why are people with blood group O referred to as universal donors? (1mk)

An experiment was set up as shown in the diagram **below**.



(a) Which process is being investigated by the above experiment? (1mk)

(b) State the expected results. (1mk)

(c) Explain your answer in (b) above. (3mks)

(a)What causes the following diseases?

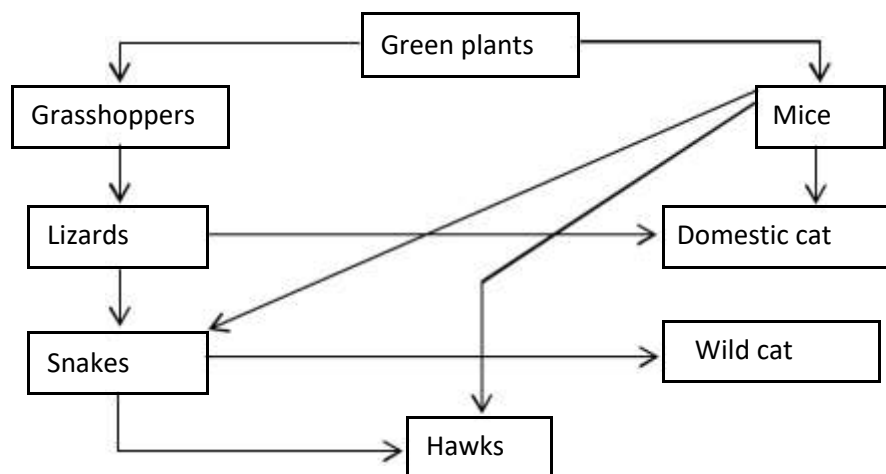
(i) Diabetes mellitus. (1mk)

(ii) Diabetes insipidus.

(1mk)

How would you test that someone is a victim of diabetes mellitus in the laboratory. (3mks)

The following chart shows a feeding relationship in ecosystem.



(a) Construct **two** food chains ending with a tertiary consumer in each case. (2mks)

(b) Which organism has the largest variety of predator in food web? (1mk)

Suggest **three** ways in which the ecosystem would be affected if there was prolonged drought.

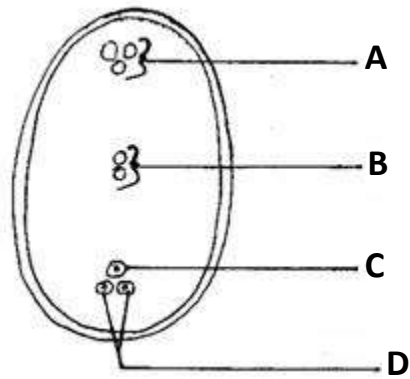
(3mks)

A man of blood group A and a woman of blood group B get married.

Using a punnet square show the possible blood groups of their offspring's if both of them are heterozygous for their blood groups. (4mks)

(b) What is the probability that one of the children will be blood group O? (1mk)

The diagram **below** shows a mature embryo sac of a flowering plant.



Name the parts labeled **A** and **D**. (2mks)

A

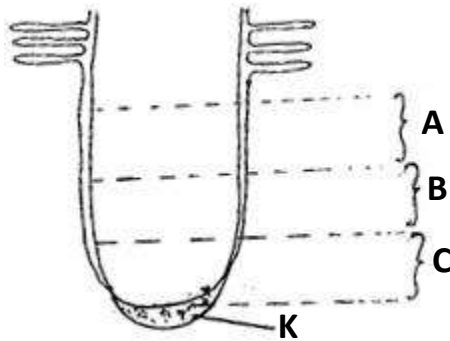
B

(b) What is the function of the structure labeled B. (1mk)

13. (a) Name the tissues that transport water in plants. (1mk)

(b) How is the tissue you named in **(a) above** strengthened? (1mk)

The diagram **below** shows regions of growth in a root. Study it and answer the questions that follow.



Name the zones labeled.

A _____ (1mk)

B _____ (1mk)

C _____ (1mk)

(b) State the function of part K. (1mk)

The enzymes pepsin and trypsin are secreted in their inactive forms.

(a) Give the names of these inactive forms. (2mks)

(b) Why are they secreted in an inactive form? (1mk)

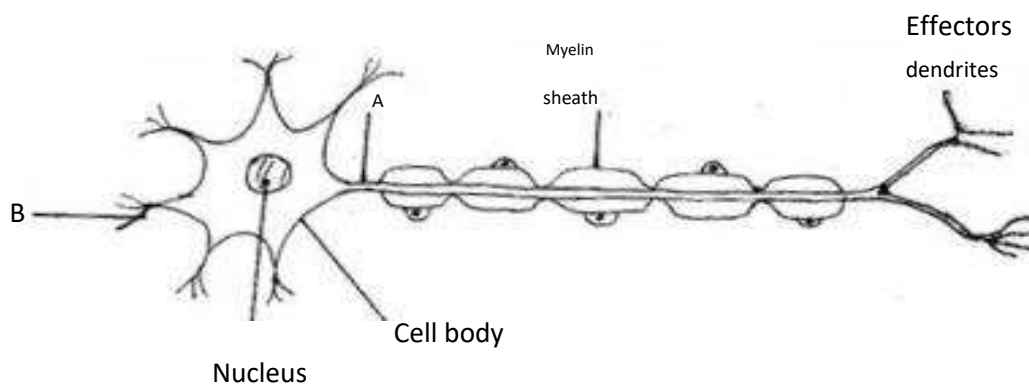
(a) Define the following terms:

Evolution. (1mk)

(ii) Analogous structures. (1mk)

Describe the importance of comparative embryology as evidence of evolution. (3mks)

Study the diagram **below** of a neurone in human being.



- (a) Identify the neurone. (1mk)

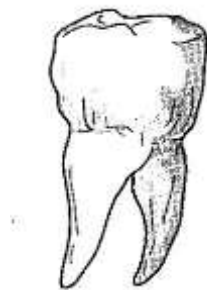
Name the parts labeled.

A _____ (1mk)

B _____ (1mk)

Using an arrow indicate the direction of movement of a nerve impulse along the neurone (1mk)

Study the diagram of the mammalian tooth **below** and answer the questions that follow.

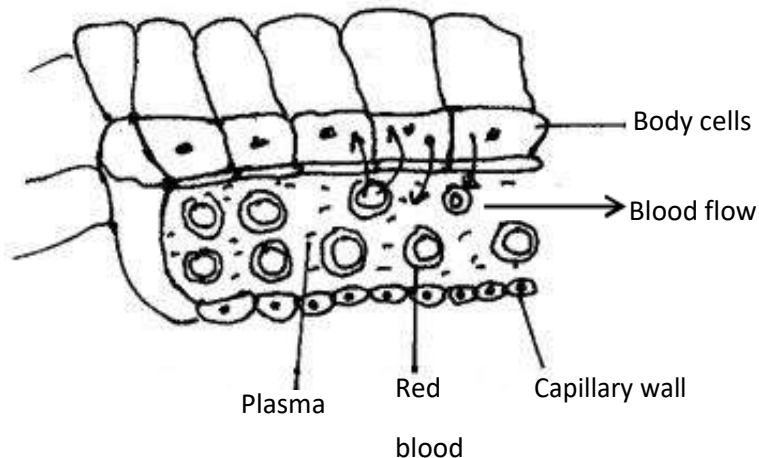


- (a) Identify the tooth. (1mk)

- (b) Give a reason for your answer in (a) above. (1mk)

(c) State **one** adaptation of the tooth to its function. (1mk)

The diagram **below** shows gaseous exchange in tissues.



(i) Name the gas that diffuses.

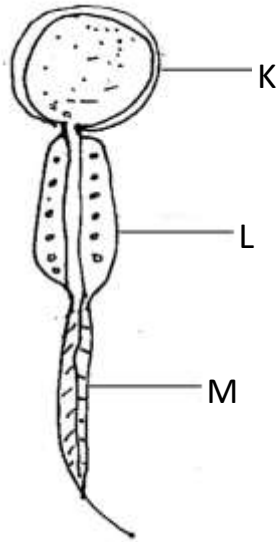
I To the body cells _____ (1mk)

II From body cells _____ (1mk)

(b) Which compound dissociates to release the gas named in **(a) (i) above**. (1mk)

(c) What is tissue fluid? (1mk)

The diagram **below** represents one of the specialized cells found in the human body.



(a) Identify the cell. (1mk)

(b) What is the function of the cell? (2mks)

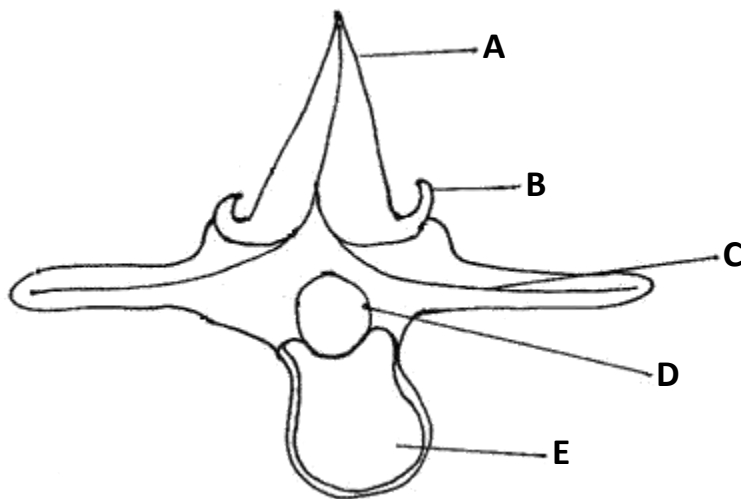
(d) Name the parts labeled.

K _____ (1mk)

L _____ (1mk)

M _____ (1mk)

The diagram **below** represents the anterior view of a certain vertebra shown **below**.



- (a) With a reason, identify the type of vertebra shown **above**. (2mks)

Name the parts labeled.

A _____ (1mk)

D _____ (1mk)

- (c) State the function of part E. (1mk)

Complete the table **below** on mineral nutrition in plants.

Mineral element	Function	Deficiency symptoms
	Synthesis of proteins and protoplasm	Stunted growth and yellowing of leaves
Calcium		
	Forms part of chlorophyll	Yellowing of leaves

(4mks)

PROJECTION NO. 19

NAME: INDEX NO:

SIGNATURE: DATE :

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your name and Index Number in the spaces provided.

Sign and write the date of examination in the spaces provided.

Answer ALL questions in the spaces provided.

Wrong spelling especially of technical terms will be penalized.

FOR EXAMINER'S USE ONLY

QUESTION	MAX. SCORE	CANDIDATE SCORE
1–29	80	

State the functions of each of the following organelles.

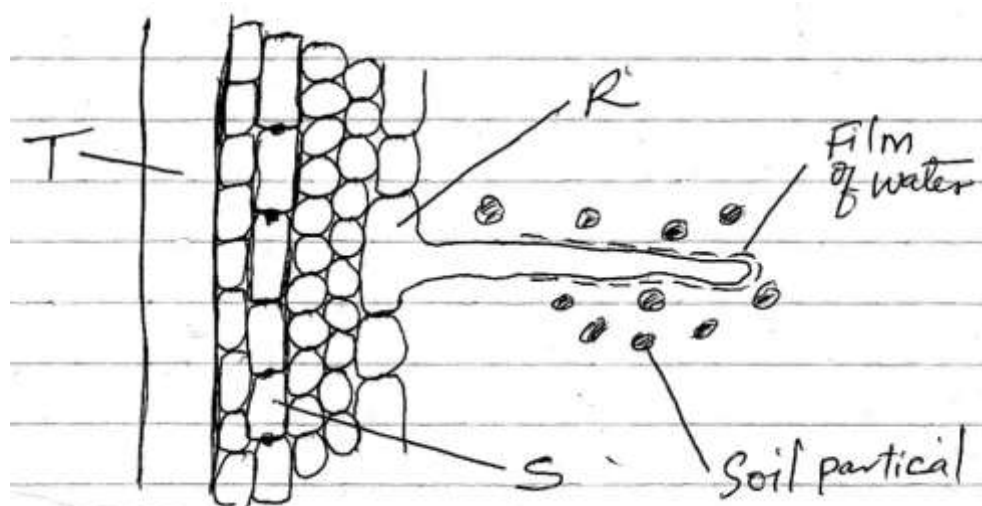
Ribosomes(1mk)

.....

(ii) Golgi apparatus (1mk)

.....

2. The diagram below represents the pathway of water from soil into the plant.



Name the structures labeled T and S.

T:.....(1m)

S:.....(1m)

State **two** ways in which the structure labeled R is adapted to its functions.

(2mks)

.....
.....

A student added equal amounts of blood to equal volumes of salt of different concentrations. She observed and counted the red blood cells at the beginning of the experiment and at end of the experiment. The results were as shown:-

Set up	Concentration of salt	Beginning	After 30 mins
A	0.1mol	500	500
B	0.01mol	500	250

Account for the results in:

(a) Set up A

(2mks)

.....
.....

(b) Set up B

(2mks)

.....
.....

Below is a dental formula of certain organisms. Use it to answer the questions that follow.

$I \frac{0}{3}, \quad C \frac{0}{1}, \quad PM \frac{3}{2}, \quad M \frac{3}{3}$

(i) Calculate the total number of teeth in the mouth of the organisms. (2mks)

(ii) Name the organisms.

(1mk)

.....

(iii) Identify the mode of nutrition of the organisms.

(1mk)

.....

(a) Give a reason why glucose does not normally appear in urine even though it is filtered in mammalian Bowman's capsule.

(2mks)

.....
.....

Which hormones are involved in the salt-water balance in human body? (2mks)

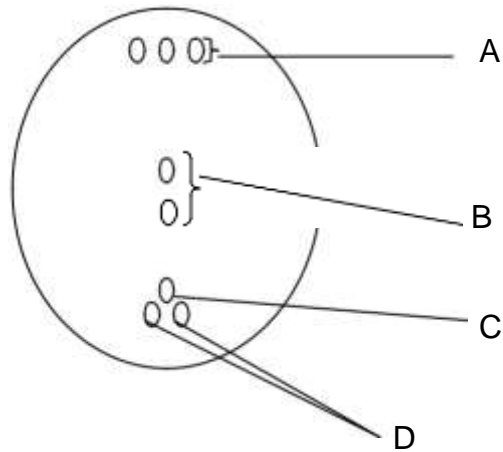
.....
.....

State **two** precautionary measures to control the outbreak of cholera.

(2mks)

.....
.....

7. The diagram below shows a mature embryo sac of a flowering plant.



(a) Name the Parts:

(2mks)

A:.....

D:.....

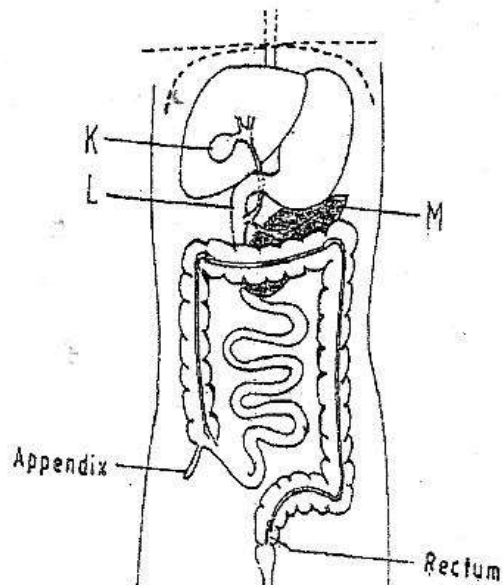
..

(b) What is the function of the structure labeled B?

(1mk)

.....

8. The diagram below represents part of the human digestive system.



Name the organs labeled L and M.

(2mks)

L:.....

M:.....

What is meant by the following terms?

Ecology(1mk)

.....
.....

(b) Carrying capacity (1mk)

.....
.....

10. Explain why individuals with smaller body sizes requires more energy per kg of body weight than those with large body sizes. (3mks)

.....
.....

11. Explain how each of the following serves as evidence for evolution.

(i) Fossil records. (2mks)

.....
.....

(ii) Comparative embryology. (2mks)

.....
.....

12. Give two differences between skeletal and smooth muscles. (2mks)

.....
.....

13. (a) State two characteristics of the Kingdom Monera that are not found in other

Kingdoms. (2mks)

.....
.....
(b) Name the class to which a termite belongs. (1mk)

.....
State **one** way in which aerenchyma tissues in aquatic plants are adapted to their function.(1mk)

.....
15. (a) State **two** functions of the blood other than transport. (2mks)

.....
(b) Name **one** defect of the circulatory system in humans. (1mk)

.....
16. Give an example of a moveable joint in humans. (1mk)

.....
17. (a) Define the term natural selection as used in evolution. (2mks)

.....
(b) State **two** examples of natural selection in action. (2mks)

.....
18. (a) Name the carbohydrate that is stored in Mammalian muscles. (1mk)

.....
List down **two** differences between polysaccharides and Monosaccharides.(2mks)

Polysaccharides	Monosaccharide
.....

19. Describe how the following parts of the mammalian ear are adapted to their functions

(a) Pinna (1mk)

.....
.....

(b) Tympanic Membrane (1mk)

.....
.....

(a) State **two** ways in which human body is naturally protected against harmful bacteria.(2mks)

.....
.....

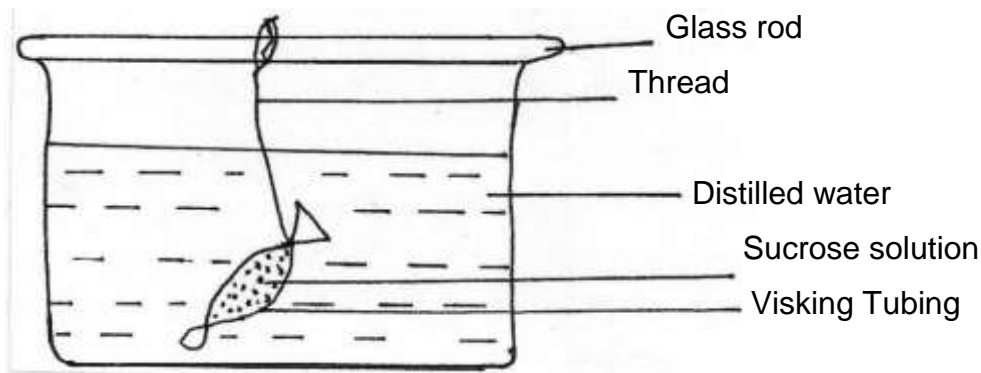
State **one** way in which the composition of blood in the pulmonary artery and that of pulmonary vein differ. (1mk)

.....

21. Describe the path taken by Carbon (iv) Oxide released from the tissues of a cockroach into the atmosphere. (2mks)

.....
.....
.....

Form One student set up an experiment shown below to investigate a certain physiological process. The set up was left for 30 minutes.



(a) Name the process under study. (1mk)

.....

(b) State the expected results after 30 minutes. (1mk)

.....

(c) Explain your answer in (b) above. (3mks)

.....

.....

.....

23. (a) Give another name of the oviduct. (1mk)

.....

•

(b) Name the hormone responsible for production of milk after perturbation. (1mk)

.....

24. Below is an example of a food chain.



Identify the trophic level occupied by:

(a) (i) Nappier grass (1mk)

.....

(ii) Hawk (1mk)

.....

1

(b) What would happen if snakes are removed from the food chain? (2mks)

.....

.....

25. (a) Define the term mutation. (1mk)

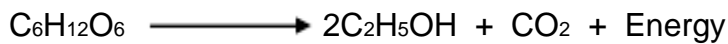
.....

(b) Name **two** sex-linked traits in humans attached to Y-chromosomes (2mks)

.....
.....
.
Explain why athletes train in high altitudes in preparation for competition. (2mks)

.....
.....
27. Briefly describe **three** characteristics of populations. (3mks)

.....
.....
28. A process that occurs in plants is represented by the equation.



Name the above process. (1mk)

.....
29. State **two** beneficial effects of transpiration to a plant. (2mks)

PROJECTION NO. 20

NAME..... INDEX NO.....

SCHOOL..... CANDIDATE'S SIGNATURE.....

DATE.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **Index Number** and **School** in the spaces provided above.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper.

Additional pages must not be inserted.

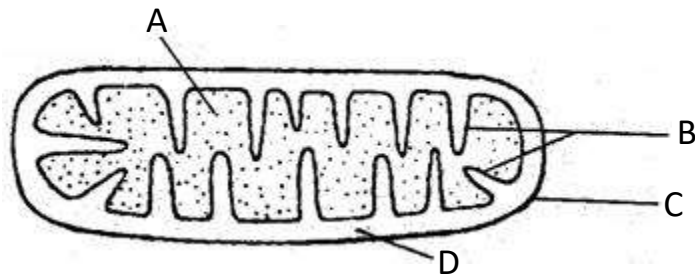
Check the question paper to ascertain that all the pages are printed and that no questions are missing.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1-26	80	

1. Name the causative agent of cholera. (1 mark)

The diagram **below** represents a cell organelle.



Identify the organelle.
(1 mark)

-
- (b) Name the part labelled **B**. (1 mark)

-
- (c) State the function of part labelled **A**. (1 mark)

State the functions of the following parts of a light microscope.

Condenser.(1mark)

(b) Diaphragm. (1 mark)

4.(a) Explain **three** ways in which a red blood cell is adapted to its function.(3 marks)

(b) In which form is carbon (IV) oxide transported. (1 mark)

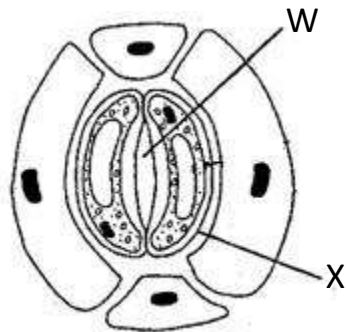
State the functions of the following organelles.

(i) Centriole. (1 mark)

(ii) Nucleolus.

(1 mark)

The diagram **below** shows part of plant tissue.



(a) Name cell labelled **X** and part labelled **W**.

(2 marks)

X

W

State **two** adaptations of cell labelled **X** to its function.

(a) Differentiate between hypogeal germination and epigeal germination. (2 marks)

(b) State **two** causes of dormancy in seed. (2 marks)

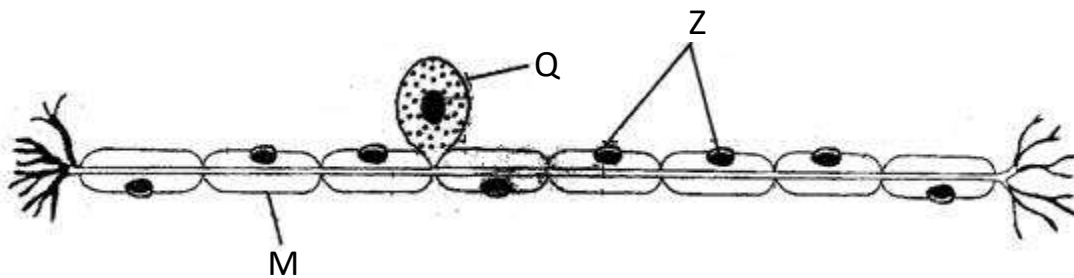
8. (a) Define polyploidy. (1 mark)

(b) Name **three** disorders resulting from gene mutations. (3 marks)

9. (a) Distinguish between homologous and analogous structure (2 marks)

- (b) Explain the term continental drift as used in evolution. (2 marks)

The diagram **below** represents a sensory cell.



- (a) Identify with a reason the type of neurone above. (1 mark)

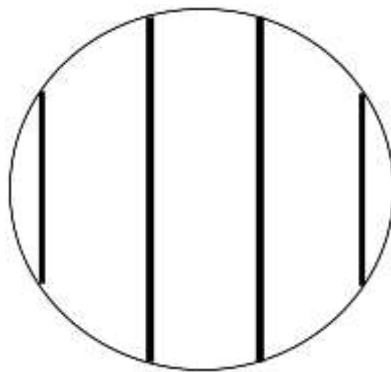
Reason: (1 mark)

- (b) Name parts labelled. (2 marks)

(a) Name **three** supportive tissues in plants. (3 marks)

(b) Name the type of muscles found in the gut. (1 mark)

A form one student trying to estimate the size of onion cells observed the following on the microscope's field of view.



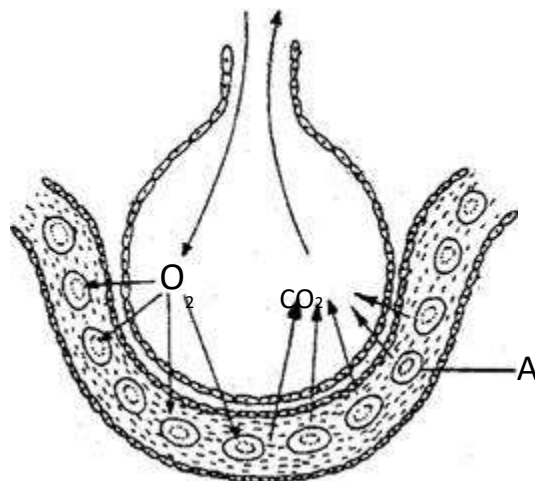
(a) Define the term resolving power. (1 mark)

If the student counted 20 cells across the field of view calculate the size of one cell in micrometers. (2 marks)

13. (a) Distinguish between transpiration and guttation. (2 marks)

- (b) State **two** importance of guttation in hydrophytes. (2 marks)

The diagram **below** shows the exchange of gases in alveolus.



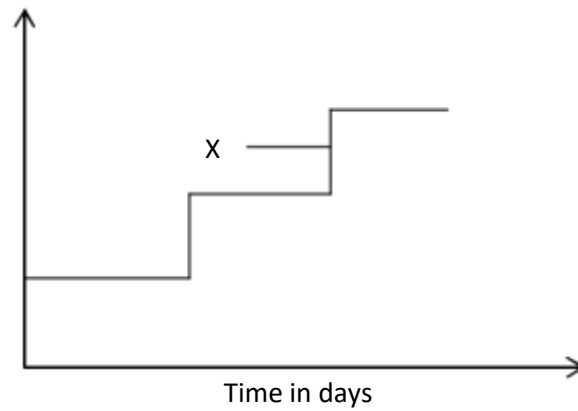
(a) State how the alveoli are adapted to their function. (3 marks)

(b) Name the cell labelled A. (1 mark)

(a) Distinguish between respiratory quotient and oxygen debt. (2 marks)

Name the site where anaerobic respiration occurs in the cell. (1 mark)

Study the graph **below** and answer the questions that follow.



- (a) What is the name given to the type of graph? (1 mark)

- (b) What is the name used to describe point X. (1 mark)

- (c) State the importance of part X. (1 mark)

(d) Name the phylum in which the graph represented in above occurs (1 mark)

17. (a) Define the term natural selection. (1 mark)

(b) Name **three** evidence of organic evolution. (3 marks)

State **one** adaptation of the following parts of mammalian eye.

(i) Fovea centralis. (1 mark)

(ii) Sclera. (1 mark)

(iii) Cilliary body.

(1 mark)

Name the cartilage found between vertebrae of the vertebral column(1 mark)

20. (a) Differentiate between gaseous exchange and ventilation. (2 marks)

Name the respiratory sites of the following:

(i) Fish

(1 mark)

(ii) Insects

(1 mark)

(a) Name **two** cardiovascular diseases. (2 marks)

If the nerve supply to the heart of a mammal is severed the rhythmic heart contraction and relaxation will go on and heart continues to beat. Explain why.(2 marks)

22. Name **two** major branches of Biology.

(2 marks)

(a) State the functions of the following apparatus.

(i) Bait trap. (1 mark)

(ii) Pooter. (1 mark)

State **two** structural adaptations of veins to their function. (2 marks)

25. Name the process that results to formation of tissue fluid. (1 mark)

What is serum? (1 mark)

PROJECTION NO. 21

NAME: INDEX NO:

SIGNATURE: DATE :

Kenya Certificate of Secondary Education (K.C.S.E.)

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your name and Index Number in the spaces provided.

Sign and write the date of examination in the spaces provided.

Answer ALL questions in the spaces provided.

Wrong spelling especially of technical terms will be penalized.

FOR EXAMINER'S USE ONLY

QUESTION	MAX. SCORE	CANDIDATE SCORE
1–30	80	

1 Name the gaseous exchange structure in woody stems. (1mk)

.....
1.0 Explain how high altitude affects the rate of breathing in humans. (2mks)
.....
.....

2.0 What is the role of vasopressin in Osmo-regulation? (1mk)
.....
.....

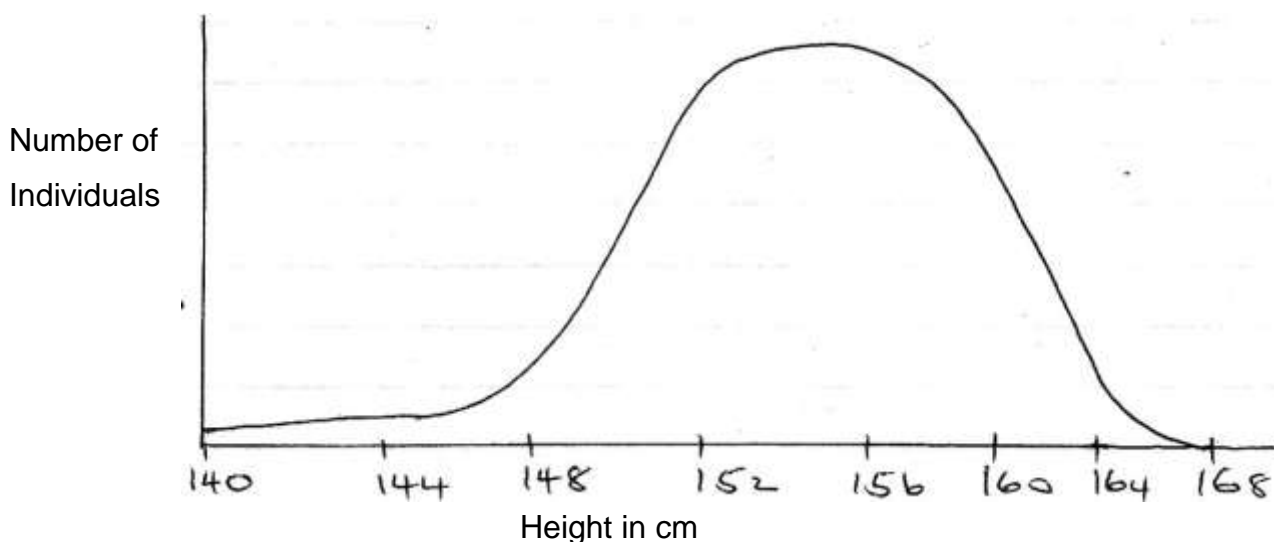
3.0 State **three** differences between members of division Bryophyta and Pteridophyta. (3mks)
.....
.....
.....

4.0 Name the structures associated with the following in human beings:

(i) Region of highest visual acuity. (1mk)
.....

(ii) Amplifications of vibrations. (1mk)
.....

5.0 In an experiment to observe some variations in length of leaves of Jacaranda, the following curve was obtained.



5.1.1 Identify the type of variation illustrated by the curve. (1mk)
.....

5.1.2 Explain the cause of the variation you have named in (a) above. (1mk)

.....
.....

5.1.3 Give two examples of the above variation in human beings. (2mks)

.....
.....

6.0 State three roles of Gibberellins in the growth and development of plant. (3mks)

.....
.....
.....

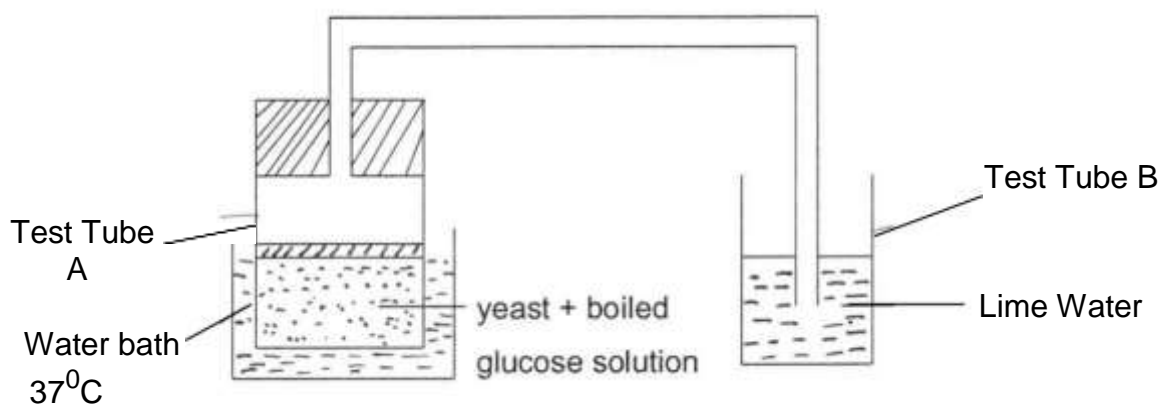
7.0 (a) If pepsinogen and trypsinogen were produced in their active forms, what would be their effect on the alimentary canal? (1mk)

.....
.....

(b) How else is the alimentary canal protected from the effects stated in (a) above? (1mk)

.....

8.0 The diagram below illustrates an experiment to demonstrate the gas produced during fermentation.



After one hour the following observations were made:

Gas bubbles appears in both tubes.

White precipitate formed in lime water.

9.0 Account for the above observations.

(3mks)

.....

.....

.....

10.0 Explain how you can set a control for the experiment.

(1mk)

.....

.....

.....

11.0 (a) Pure lines of black and white mice were crossed. All the F1 generation were grey. Explain the absence of white and black mice in the F1 generation. (1mk)

.....

.....

.....

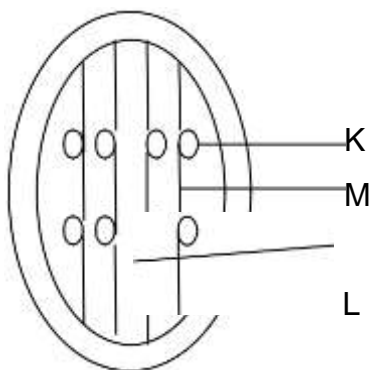
(b) Define multiple alleles.

(2mks)

.....

.....

12.0 The diagram below represents a chloroplast.



Name the parts labeled M and L.

(2mks)

M:

L:

(b) List **two** processes that take place in the structure labeled K. (2mks)

.....
.....

13.0 Explain how geographical distribution of organism is an evidence of organic evolution. (4mks)

.....
.....
.....
.....

14.0 A student used 1m^2 quadrat to determine the population of striga weed in a 20m x 20m plot. He collected the data and recorded it as shown below.

Quadrat (throws	Population of striga weed
1	19
2	12
3	11
4	14
5	16

Using the data above, determine the total population of striga weed. (3mks)

15.0 (a) Why is the Afferent arteriole wider than the efferent arteriole in the kidney

nephron? (2mks)

.....
.....

Explain why plasma proteins and blood cells are absent in glomerular filtrate.

(2mks)

.....
.....

16.0 Two strips A and B were from a potato whose cell sap was 30% sugar. The strip A was placed in a solution of 10% sugar concentration while strip B was placed in 50% sugar concentration.

(a) What change was expected in strips A and B? (2mks)

Strip A.....

Strip B:.....

(b) Account for the results in strip A. (3mks)

.....
.....
.....

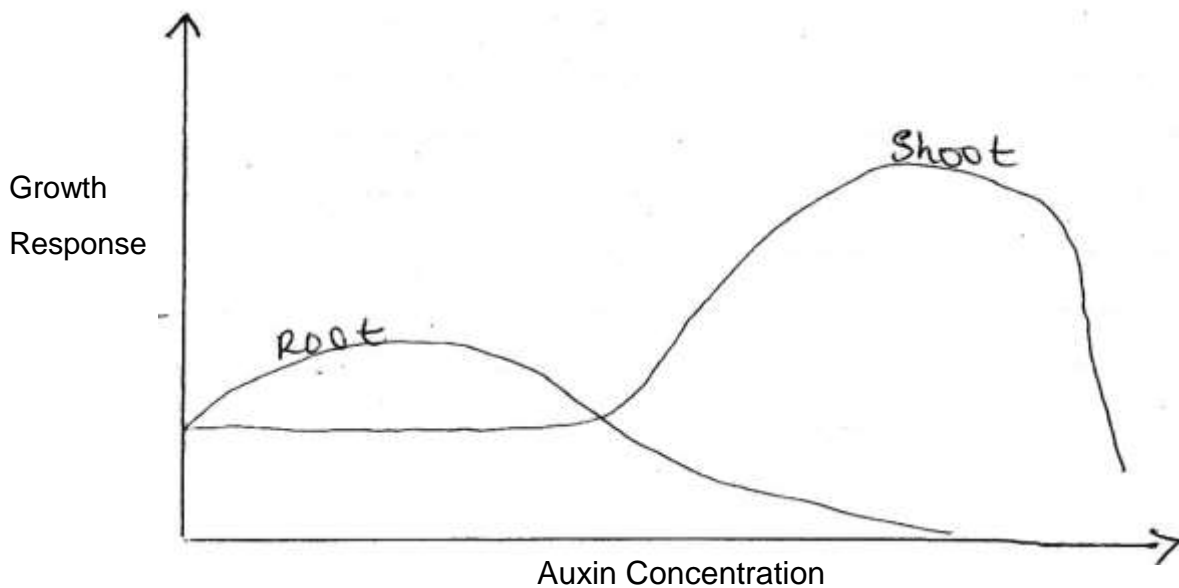
17.0 The diagram below represents a stage during cell division.



17.1.1 Identify the stage of cell division. (1mk)

17.1.2 Give two reasons for your answer in (a) above. (2mks)

18.0 The diagram below shows the difference in growth response to varying hormone concentration by root and shoot.



What is the effect of increasing auxin concentration on:

18.1 Roots (1mk)

.....
 18.2 Shoot (1mk)

19.0 Give **two** structural differences between smooth muscles and skeletal muscles.(2mks)

Smooth muscle	Skeletal Muscle
(i)	
(ii)	

20.0 (a) Name the structure on the bodies of Arthropods responsible for intermitted growth curve pattern. (1mk)

.....
 .

(b) Name the region in plants where the following take place:

(i) Primary growth (1mk)

.....

(ii) Secondary growth (1mk)

.....

21.0 (a) State **two** importance of predation in an ecosystem. (2mks)

.....

(b) Apart from predation, state **two** other biotic factors that will influence the distribution of an organism in an ecosystem. (2mks)

.....

22.0 Differentiate between myopia and hypermetropia. (2mks)

.....
.....
23.0 State **two** advantages of hybrid vigour. (2mks)

.....
.....
24.0 Explain how the following factors determine the amount of energy human being requires in a day.

(i) Basal Metabolic Rate. (1mk)

.....
.....
(ii) Age (1mk)

.....
.....
25.0 Explain the significance of the following processes in living organism.

2 Reproduction . (1mk)

.....
3 Irritability. (1mk)

.....
4 Excretion. (3mks)

.....
26.0 (a) What is the role of diastema in herbivores. (1mk)

.....
.....
(b) Name the **two** types of periodontal diseases. (2mks)

.....
.....
(c) What is the significance of emulsification? (1mk)

.....
.....
27.0 Name **two** organelles present in unicellular organism but absent in cells of multi-cellular organisms. (2mks)

.....
.....
28.0 Explain how increased temperature affects the rate of transpiration in plants.

.....
.....
29.0 Explain the adaptations of collenchyma as a tissue in plant. (2mks)

.....
.....
30.0 Name the disease of blood characterized by:

(i) Crescent shape haemoglobin. (1mk)

.....
(ii) Abnormally large number of white blood cells. (1mk)

.....
.....
31.0 A rainbow lizard was seen basking on a rock. Name **two** ways by which it gained heat by these behavioural process. (2mks)

PROJECTION NO. 22

NAME:.....INDEX NUMBER:.....

DATE:.....

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Answer all the questions in the spaces provided in this paper.

FOR EXAMINER'S USE ONLY

Questions	Maximum score	Candidates score
1- 40	80	

Name the hormone that is responsible for the development of a deep voice in humans. (1 mark)

.....

2. The relationship between fungi and algae in a lichen is best described as: (1 mark)

.....

3. Name the bacteria found in the root nodules of leguminous plants. (1 mark)

.....

4. In which part of the cell does each of the following processes take place? (2 marks)

(a) Glycolysis

(b) Krebs cycle

5. Name the structure used for excretion in fresh water protozoa. (1 mark)

.....

6. State two mechanisms of excretion in terrestrial green plants. (2 marks)

.....

.....

.....

.....

7. Name the gamete cells that are produced by ovaries. (1 marks)

.....

.....

8. Name three abiotic factors in a soil ecosystem. (3 marks)

.....

.....

9. Define facultative anaerobe. (1 mark)

.....

.....

.....

.....

10. What is meant by single circulatory system? (1 marks)

.....

.....

.....

11. What is meant by a test cross in genetics? (2 marks)

.....

.....

.....

.....

12. Give the scientific name of the bacterium that causes tuberculosis in humans. (1 mark)

.....

.....

13. (a) Name two chemicals that undergo no digestion. (2 marks)

.....

.....

(b) Explain why the chemicals names in (a) above undergo no digestion. (1 mark)

.....

.....

14. Which part of the ovule forms the following structures after fertilization? (2 marks)

(a) Zygote.....

(b) Testa.....

15. The process by which living organisms take oxygen into their bodies and release Carbon(VI) oxide into the environment is called? (1 mark)

.....

16. Name three requirements of a plant to carry out photosynthesis (3 marks)

.....

.....

.....

.....
.....
17. The branch of biology that deals with the study of structure of living things that can be seen by the unaided eye when the animal is dissected is called? (1 mark)

.....
18. Give one merit of internal fertilization e.g. in humans. (1 mark)
.....
.....
.....
.....

19. Give the importance of mosaic leaf arrangement. (1 mark)

.....
20. State 3 features that a grasshopper, a crab and a spider have in common. (3 marks)
.....
.....
.....
.....

21. Name one plant excretory product that is harnessed and used as a local anesthetic. (1 mark)
.....

22. State the importance of each of the following features of the mammalian ileum.
(a) Highly coiled. (1 mark)
.....
.....

(b) Long (1 mark)
.....
.....

23. State two ways in which food is mechanically digested in a mammal. (2 marks)

.....

.....

.....

.....

The body cells of an organism contain two copies of 24,000 genes i.e. 48,000 genes in total of these. How many genes would have been inherited from the organism's female parent?
(1 mark)

.....

.....

Besides direct drinking, name two other sources of water in nutrition of man. (2 marks)

.....

.....

.....

.....

State the importance of the following features of mammalian lungs.

(a) Spongy and elastic (1 mark)

.....

.....

(b) Pleural fluid (1 mark)

.....

.....

27. Give the term used to describe the following organelle / features of cells.

(a) They become visible only when the cells are dividing. (1 mark)

.....

.....

(b) A term which means "made of many cells". (1 mark)

.....

.....

28. Give 2 reasons why humans (Homo sapiens), unlike garden peas (Pisum sativum), are not convenient subject for genetic studies. (2 marks)

.....

.....

.....

.....

.....

.....

Identify each of the genetic disorders in man, characterized by the symptoms described in (a) and (b) below.

Inability to distinguish between blue and green colour and various shades of red.
(1 marks)

.....

(b) Lack of the protein dystrophin resulting in a progressive weakening of body muscles and inco-ordinated body movement.
(1 mark)

.....

30. Inscribed on the casing of an objective lens of a light microscope are x5 and 0.14. Specify what 0.14 represents.
(1 mark)

.....

31. (a) It was found that during germination of pea seeds, 9.00 cm^3 of oxygen was used while 9.2 cm^3 of carbon (IV) oxide was produced. Calculate the RQ.
(3 marks)

.....

.....

.....

.....

.....

.....

(b) Identify the food substance that was metabolised.
(1 mark)

.....

32. (a) Under what conditions is carboxyhaemoglobin formed in the human body.(1 mark)



.....
.....
.....

(b) Why does accumulation of carboxyhaemoglobin cause death? (2 marks)

.....
.....
.....

33. Give 2 functions of each of the following structures in the human reproductive system.
(a) Epididymis. (2 marks)

.....
.....
.....
.....

(b) Oviduct (2 marks)

.....
.....
.....
.....

To estimate the population of Tilapia using the capture recapture method, 60 fish were captured marked and released. In the second capture, out of 72 fish, 10 had been marked. Calculate the estimated population of Tilapia. (Show your working). (3 marks)

.....
.....
.....

35. (a) Describe the vestibular apparatus of the ear. (1 mark)

.....

(b) State the role of the vestibular apparatus. (1 mark)

.....
.....

(c) Name the smallest ear oscicle. (1 mark)



.....
36. State two distinguishing features of scapula. (2 marks)

.....
.....
.....
.....

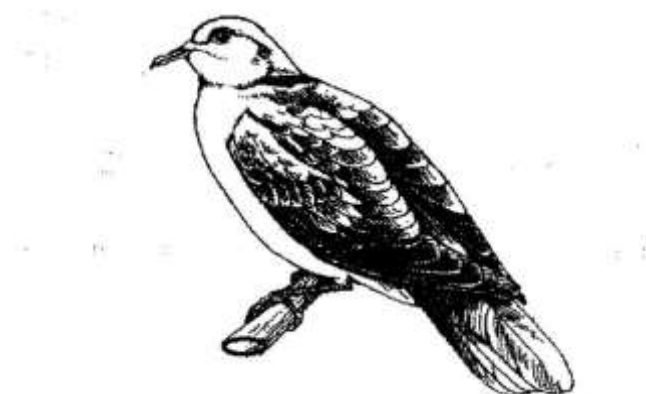
37. (a) What is meant by biological control? (1 mark)

.....
.....
.....

(b) Give two examples of biological control. (2 marks)

.....
.....
.....

38. The diagram below represents a certain animal.

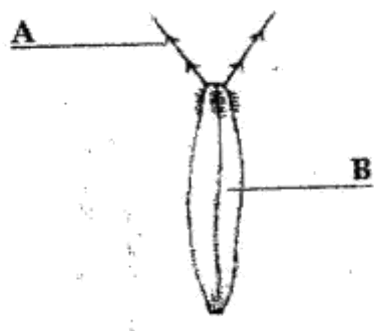


(a) Name the taxonomic class to which the animal belongs. (1 mark)

.....

(b) Label on the diagram, three features in which are characteristics of organisms in the class named in (a) above. (3 marks)

The diagram below shows a fruit specimen dispersed by a certain agent. Study the diagram carefully and then answer the questions that follow.



(a) What type of fruit is represented by the diagram above? (1 mark)

.....

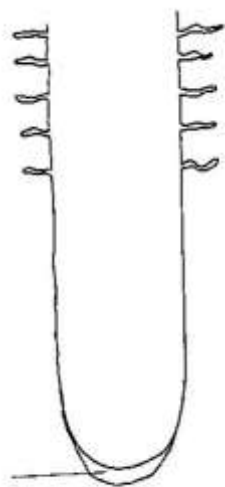
(b) Name each of the parts labeled A & B. (2 marks)

A..... B.....

(c) Name the agent of dispersal of the fruit.

.....

40. On the diagram of root tip below label each of the following. (2 marks)



Zone of cell elongation.

Zone of cell differentiation.

PROJECTION NO. 23

NAME_____ INDEX NO._____

SCHOOL_____ DATE_____

CANDIDATES SIGNATURE_____

231/1

BIOLOGY (THEORY)

PAPER 1

INSTRUCTIONS TO CANDIDATES

Write your name, index number, school and date in the space provided

Sign and write the date of the examination in the spaces provided above

Answer ALL the questions in the spaces provided

For examiner's use only

Question	Maximum score	Candidates score
1-32	80	

Explain the importance of the following life processes

(a) Respiration (1mk)

(b) Reproduction (1mk)

2. a) State two characteristics of Phylum Arthropoda (2mks)

Name the taxonomic unit that comes immediately after kingdom in classification
(1mk)

State the role of the following organelles

Lysosomes

(ii) Mitochondria (2mks)

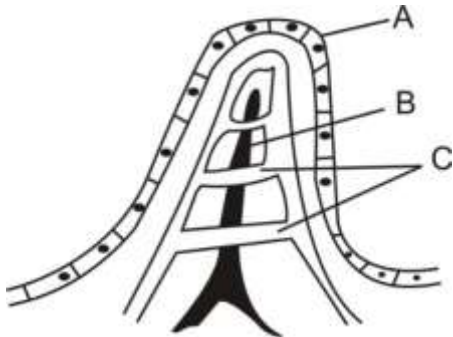
4. Describe how osmotic pressure develops (3mks)

Name the two stages of photosynthesis and state where each stage occurs

	Stage of photosynthesis	Where it occurs
i		
ii		

(2mks)

The diagram below represents part of alimentary canal



(a) Name the structure represented above (b) (1mk)

Identify the part labeled A (1mk)

(c) State the products that diffuse into part labeled:

B
C (2mks)

(a) Explain why the xylem vessels are more efficient than tracheids in conducting water (2mks)

State two ways in which xylem vessels are adapted to their functions (2mks)

Explain why it's not advisable to be in a poorly ventilated room with a burning charcoal jiko (3mks)

9. State adaptations of aerenchyma tissue to its function (2mks)

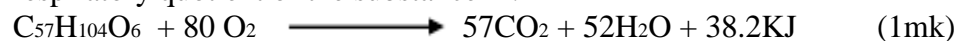
10. State two similarities between members of class Aves and class Reptilia (2mks)

Name the causative agents of the following diseases in humans

Typhoid

Amoebic dysentery (2mks)

(i) A food substance $C_{54}H_{104}O_6$ is oxidized completely. Work out the respiratory quotient of the substance in:



(ii) State the type of food being oxidized (1mk)

(iii) Give a reason for your answer in 12 (ii) above (1mk)

State two reasons why plants do not require complex excretory organs like animals (2mks)

(a) Give a reason why it is necessary for frogs to lay many eggs (1mks)

Give a reason of each of the following hormones in reproduction

(i) Oxytocin (1mk)

(ii) Oestrogen (1mk)

15. State two factors in seeds that cause dormancy (2mks)

A part of one strand of DNA molecule was found to have the following sequences.

G-C-C-T-A-G-A-T-C-A-C

(a) What is the sequence:

(i) Of the complimentary DNA strand? (1mk)

(ii) Of an M-RNA strand copied from this DNA portion (1mk)

17. (a) Define continental drift as used in evolution (2mks)

(b) What is meant by the term phylogenetic linkage (1mk)

(c) State why Lamark's theory of evolution was rejected (1mk)

18. (a) Define the term phototaxis (1mk)

(b) State the biological importance of phototaxis (2mks)

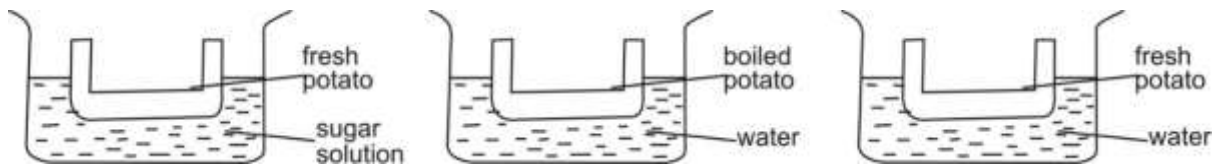
What is the name given to the tissue that joins:

(i) Bone to bone (1mk)

(ii) Muscle to muscle (1mk)

20. State the name given to the study of the cell (1mk)

In an experiment a biology teacher set up the materials indicated below:



If the experimental set up was left overnight, explain the appearance of the potato tissue in:

A (1mk)

B (1mk)

C (1mk)

22. Explain why the left ventricle has thicker walls than the right ventricle (1mk)

State the function of the following features in the inner wall of the trachea and bronchi in a mammal

(i) Cilia (1mk)

(ii) Mucus (1mk)

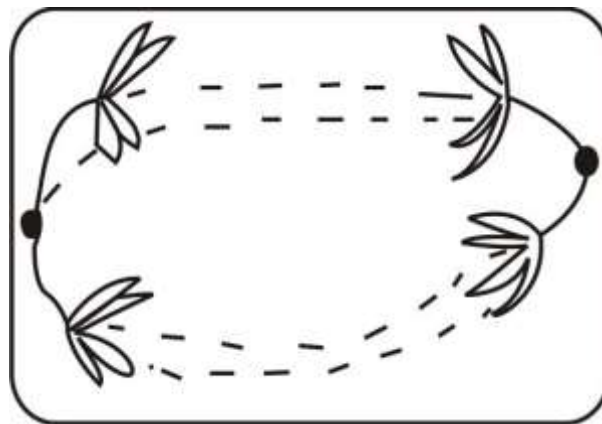
Distinguish between members of class monocotyledonae and dicotyledonae under the following headings:

(i) Leaf petiole (1mk)

(ii) Floral parts (1mk)

25. Distinguish between interspecific and intraspecific competition (2mks)

The diagram below represents a stage during cell division



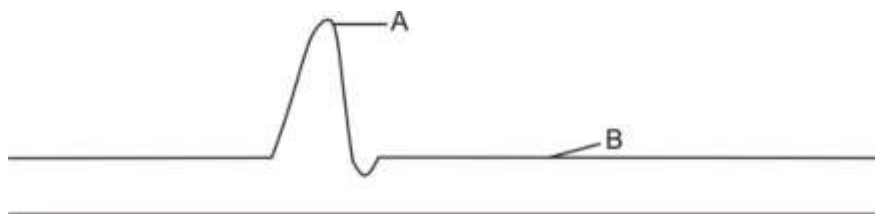
(a) Identify the stage of the cell division (1mk)

(b) Give reasons for your answer in (a) above (3mks)

A cross was made between red flowered plant and white flowered plant. All the filial generation on were pink. Using suitable symbols to represent their genotypes, show a cross between two pink flowered plants (3mks)

28. Name three Y-sex linked traits in man (3mks)

Study the diagram below.



(a) On the diagram show the direction of impulse transmission (1mk)

State the condition at which parts A and B Are:

A

B (2mks)

Fats produce high amount of energy on oxidation yet they are not the main respiratory substrate. Explain. (2mks)

31. Name structures used for gaseous exchange in higher plants (2mks)

32. Explain why glucose and proteins are absent in urine of a healthy person (2mks)

PROJECTION NO. 24

NAME..... INDEX NO.....

231/1

CANDIDATE'S SIGN.....

BIOLOG

PAPER 1

DATE.....

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **Index Number** and **School** in the spaces provided above.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper.

Additional pages **must not** be inserted.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1-25	80	

(a) Name the branch of Biology that deals with the study of phylogenetic relationship among organisms. (1 mark)

Define each of the following terminologies.

(i) Microbiology. (1 mark)

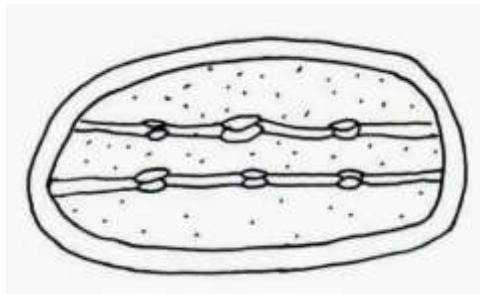
(ii) Anatomy. (1 mark)

Name the specific causative agent of the following diseases in man.

(a) Ascariasis. (1 mark)

(b) Syphilis. (1 mark)

The diagram below is of an organelle found in plant cells.



- (a) Name the plant cell that has large number of the organelle above. (1 mark)

Name the cellular organelle that would be abundant in;

- (a) Castor oil seeds. (1 mark)

- (b) Nectaries of the moon flower. (1 mark)

4. (a) How do temperature affects the rate of active transport? (2 marks)

How do the following factor affect the rate of diffusion;

- Diffusion gradient. (1 mark)

State the importance of the following substances in nutrition;

(a) Roughage. (1 mark)

(b) Water. (2 marks)

(c) Name the substances stored in animal's body which is similar to starch in plants. (1 mark)

(a) Haemoglobin is enveloped by the plasma membrane of erythrocytes. Give two possible reasons for phenomenon. (2 marks)

(b) What is the function of the piliferous layer in rock? (1 mark)

7. (a) Name **two** structures of gaseous exchange in aquatic plants. (2 marks)

State **two** adaptive characteristics of respiratory surfaces common to the gills of a fish and the trachea system of insects. (2 marks)

A certain substance has a molecular formula $C_5H_{11}O_6$

Write a balanced equation to represent its complete oxidation to carbon (IV) oxide and water. (1 mark)

(ii) Calculate the respiratory quotient of the complete oxidation. (2 marks)

(iii) From the RQ in (ii) above, what is the substance being metabolized. (1 mark)

9. (a) State the main inorganic substance in the liver. (1 mark)

(b) State **three** adaptations of desert animals to reduce loss of water. (3 marks)

A student collected an organism with;

2 body parts.

4 pairs of limb.

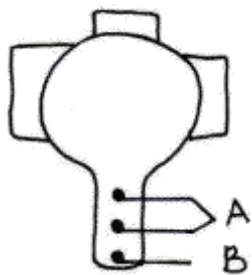
No antennae.

(a) Identity the class the organism belong. (1 mark)

(b) State salient characteristics of kingdom monera. (2 marks)

Explain the reason why the carrying capacity of wild animals is higher than that of sheep
in any given piece of land.
(3 marks)

The diagram below shows a pollen tube as it develops down the style.



(a) Name the part labelled **A** and **B**. (2 marks)

A _____

B _____

(b) State the function of the part labelled **A**. (2 marks)

(a) Explain the importance of fertilisation taking place in the fallopian tubes and not in the uterus in human females. (3 marks)

(a) Name **two** tissues in plant stem are responsible for secondary growth. (2 marks)

(b) Define the term parthenogenesis. (1 mark)

15. Define the following terms. (4 marks)

Genetic engineering.

Gene mapping.

Heterosis.

Gene sequencing.

(a) What type of variation is exhibited by human beings having blood group A, B, AB or O.

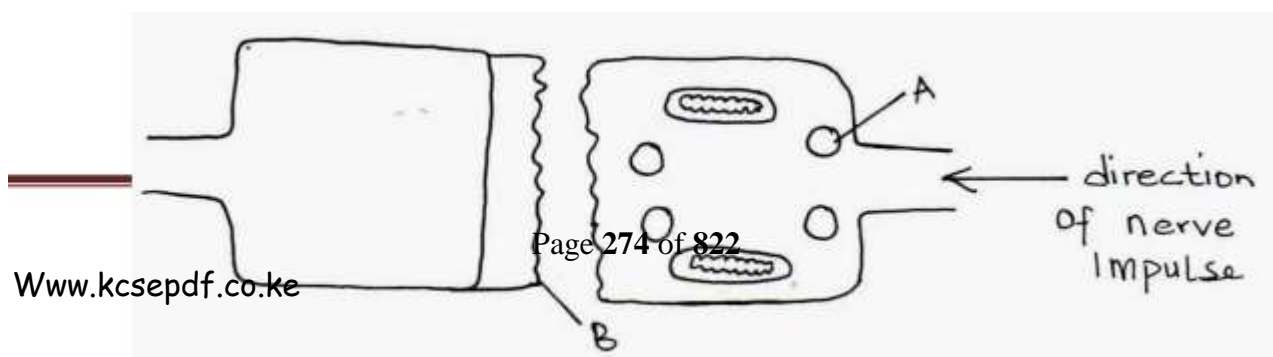
_____ (1 mark)

The paddles of whales and fins of fish adapt these two organisms to aquatic habitats;
Name the evolutionary process that may have given rise to such similar structures.

_____ (1 mark)

(c) What name is given to such structures? (1 mark)

The diagram below shows two adjacent synaptic knobs.



(a) Name the structures labelled **A** and **B**. (2 marks)

A _____

B _____

Name the substance in the structure labelled **A** that facilitates impulse transmission. (1 mark)

State **two** features of nerves which increases the speed of nerve impulse transmission along them. (2 marks)

(a) Give **two** structural differences between skeletal muscles and smooth muscles. (2 marks)

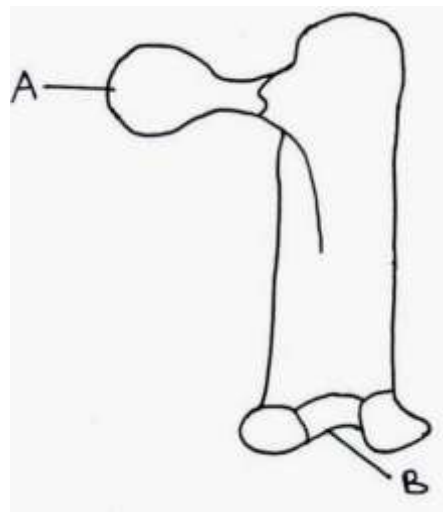
Name **one** support tissue in plants that is;

(a) Thickened with lignin. (1 mark)

(b) Thickened with cellulose and pectin.

(1 mark)

The diagram below represents a mammalian bone.



(a) Identify the bone.

(1 mark)

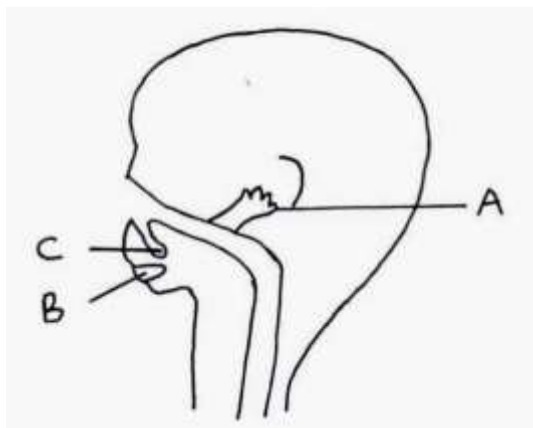
Name the type of joint formed by the bone at its anterior end and the adjacent bone. (1 mark)

20. (a) Differentiate between an enzyme and a hormone.

(2 marks)

(b) Name the hormones involved in osmoregulation. (2 marks)

The diagram below shows the mouth and the salivary glands.



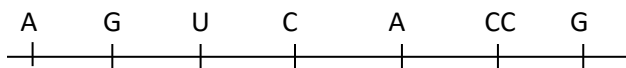
(a) Name the glands labelled **A** and **B**. (2 marks)

A _____

B _____

- (b) Give **two** digestive functions of saliva. (2 marks)

Below is a nucleic acid stand.



- (a) Name the nucleic acid. (1 mark)

- (b) Give a reason for your answer in (a) above. (1 mark)

23. (a) Name the organism found in the root nodules of leguminous plant. (1 mark)

- (b) What is the role of the organism named above? (1 mark)

(a) Name the process that occurs when carbon (IV) oxide combines with hydrogen atoms
from light stage. (1 mark)

(b) What is the main product of dark stage of photosynthesis? (1 mark)

25. (a) State the function of the following. (2 marks)

Tendon.

Ligament.

PROJECTION NO. 25

NAME..... INDEX NO:.....

Candidate's signature.....

Date.....

231/1

BIOLOGY

PAPER I

(Theory)

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided

Answer all questions in the spaces provided

Wrong spelling especially of technical terms will be penalized.

FOR EXAMINER'S USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-30	80	

State the functions of the following cell organelles. (2 marks)

Golgi apparatus

.....
.....

Mitochondria

.....
.....

State two ways in which xylem vessels are adapted to their functions. (2 marks)

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.....

Distinguish between Ecology and Ecosystem. (2 marks)

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.....

4. a) What is Natural selection. (1 mark)

.....
.....

What is meant by the following terms? (4 marks)

Homologous structure

.....
.....

Example

.....
.....

Analogous structure

.....
.....
.....

Example

.....

.....

a) State two disadvantages of sexual reproduction. (2 marks)

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.....

b) State two adaptations of the human spermatozoa. (2 marks)

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5. What adverse effects do skin lightening cosmetics have on the user? (2 marks)

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Name the structures in liverworts that produce. (2 marks)

Male gametes

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Female gametes

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State three effects of dumping untreated sewage into a river. (3 marks)

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a) State two factors within the seed that cause seed dormancy. (2 marks)

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b) State two characteristics of meristematic cells in plants. (2 marks)

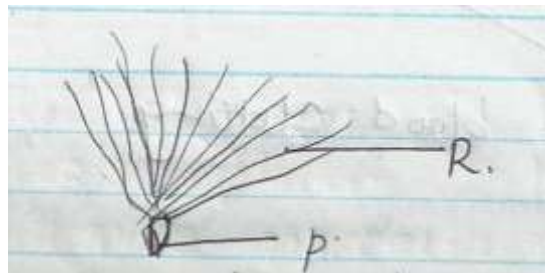
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9. Study the diagram below and answer the questions that follow.



Name each of the structure labeled P and R. (2 marks)

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(i) Name the type of fruit represented above. (1 mark)

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Explain one observable way in which the fruit is adapted to its mode of dispersal. (1 mark)

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After a person had swum the length of a pool and climbed out of the water their skin temperature is likely to be very low but their deep body temperature is likely to be normal

Why is the skin surface likely to be cold for sometime after leaving water? (2 marks)

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State two roles of the secretion of the sebaceous glands. (2 marks)

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State two adaptations of tracheoles of insects for gaseous exchange. (2 marks)

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Define the term accommodation of the eye. (1 mark)

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Identify:

Photochemical pigment for dim light vision. (1 mark)

.....

.....

Photochemical cell with low visual Acquity. (1 mark)

.....

.....

a) State the functions of each of the following in the mammalian skeleton.

Intervartebal disc (1 mark)

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Vertebrarterial canal (1 mark)

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.....

b) State one main structural difference between axis and atlas. (1 mark)

.....

.....

a) Differentiate between continous and discountinous variation. (1 mark)

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.....

b) State one example of numerical chromosomal mutations. (1 mark)

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a) The respiratory quotient of an active person is normally in the range of approximately 1.0. If a person is deprived of food for 24 hours, the RQ drops to 0.75. Explain. (2 marks)

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Explain what happens to Red blood cells when its placed in hypertonic solution (2 marks)

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18. An animal has the following dental formula

I 3	c 1	pm 4	m 2
3	1	4	3

Calculate the number of teeth. (1 mark)

.....

.....

Explain what would result from blockage of bile duct. (2 marks)

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Explain how the guard cells are adopted to their functions. (2 marks)

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a) Give one application of osmosis in humans. (1 mark)

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b)Explain the effect of each of the following on the rate of active transport.



Oxygen concentration (1 mark)

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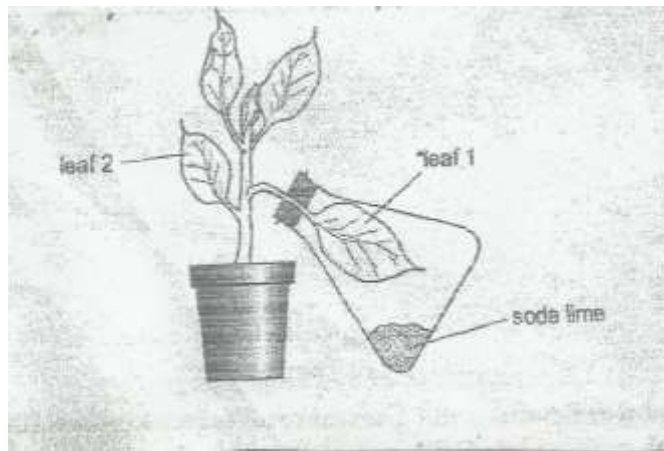
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Glucose concentration (1 mark)

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In an experiment, the apparatus shown in the diagram below was left in the light for two days and then leaves 1 and 2 were tested for starch.



What was the aim of the experiment.(1 mark)

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Account for the observations made when the leaves 1 and 2 were each tested for starch. (2 marks)

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22. The table below shows an analysis of urine and of blood after filtration in the kidney.

substance	Percentage of substance	
	In blood	In urine
Glucose	0.10	0.00
Salts	0.30	0.60
Urea	0.03	2.00
water	90.00	97.00

Account for the difference in concentration of urea in blood and urine. (2 marks)

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Explain why glucose is absent in urine yet present in blood. (1 mark)

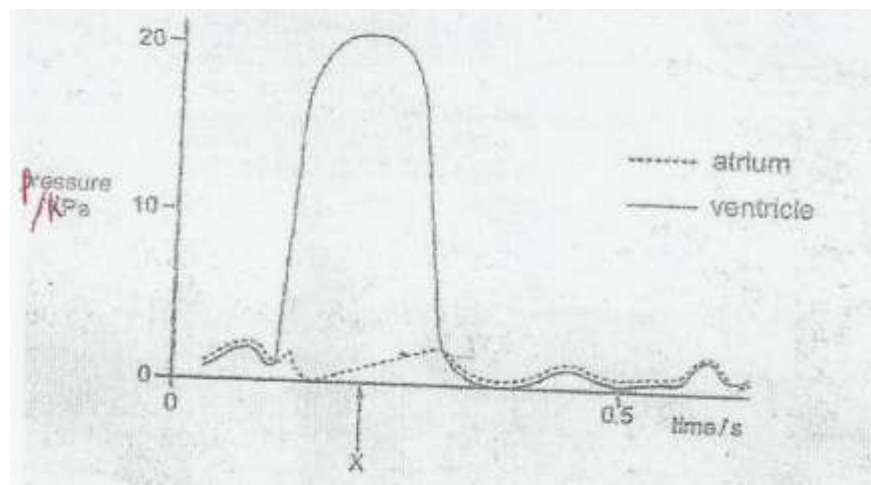
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24. The graph shows pressure changes in the left atrium and in the left ventricle during the heart beat.



What is the state of the following valves at time x

Semi lunar valve in the aorta (1 mark)

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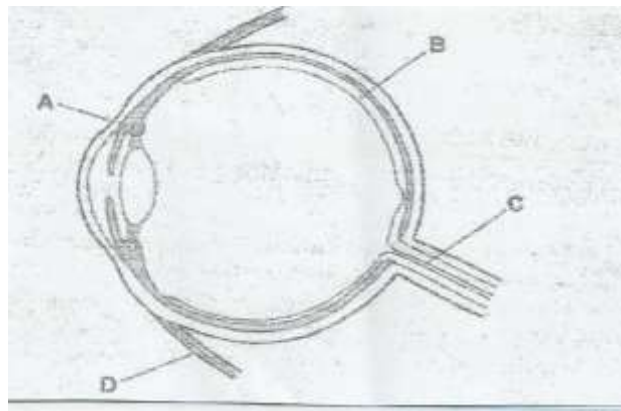
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Bicuspid valve (1 mark)

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.....

25. The diagram below shows a section through an eye.



Which part helps to focus an image on the retina? (1 mark)

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.....

State the functions of each of the parts marked A and B. (2 marks)

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26. a) Name the type of response exhibited by Euglena swimming towards fresh water from saline water. (1 mark)

.....

.....

b) State the survival value of this response. (1 mark)

.....

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a) State two differences between daughter cells from mitosis and from meiosis. (2 marks)

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b) State one difference between Deoxyribonucleic acid and Ribonucleic acid. (2 marks)

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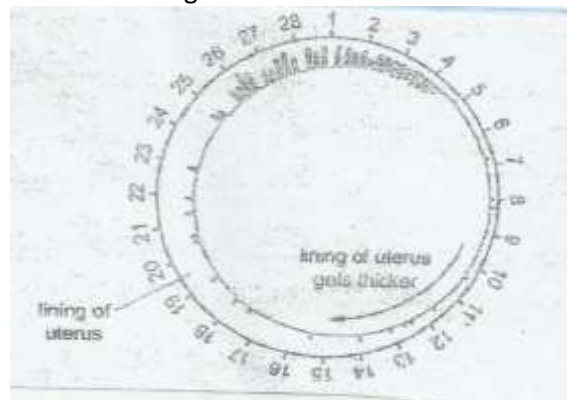
.....

Give one example of numerical chromosomal mutation. (1 mark)

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28. The diagram shows the changes that occur to the uterus lining during the menstrual cycle.



Name the hormone responsible for;

The events that occur in days 4 to 10. (1 mark)

.....

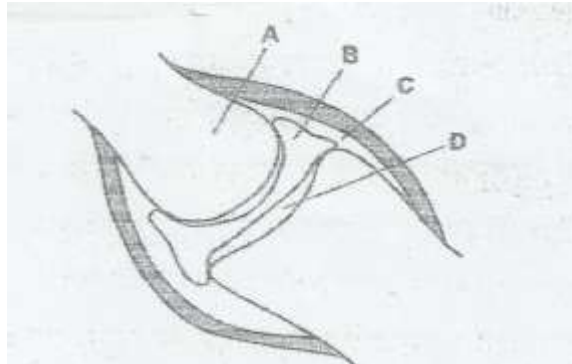
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Ovulation. (1 mark)

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.....

29. The diagram below shows a synovial joint.



Which area contains synovial fluid. (1 mark)

.....

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Name the type of synovial joint shown above. (1 mark)

.....

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Pure breeding pea plants with green pods are crossed with pure breeding pea plants with yellow pods. All the offspring's have green pods, plants from these offspring's are crossed. What colour are the pods of the next generation?
(2 marks)

PROJECTION NO. 26

Name Index No
School Candidates Sign
Date

231/1

Biology Paper 1 (Theory)

TIME: 2 Hours

Instructions to candidates

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the space provided above.

Answer all questions in the space provided.

Candidates should check the question paper to ascertain that all the pages are printed.

For Examiner's Use Only

Question	Maximum Score	Candidates Score
1-27	80	

1. Name two structure that link the foetus to its mother. (2 mks)

2. (a) Name one class in phylum chordata where organisms undergo metamorphosis. (1 mks)

(b) State two main distinguishing features found in class mammalia only. (2 mks)

3. (a) What is carapace? (1 mks)

(b) State two ways in which the exoskeleton has helped in the success of arthropods life in terrestrial habitats. (2 mks)

4. (a) What is meant by the term “allele”. (1 mks)

Distinguish between dominant and recessive alleles. (2 mks)

(a) State two organic pollutants of the rivers flowing through urban centres in Kenya. (2 mks)

(b) Apart from solid wastes, state two major pollutants on land. (2 mks)

6. (a) What is organic evolution? (2 mks)

(b) Explain why certain rugs become ineffective in curing a disease after many years of use. (2 mks)

(a) What is the meaning of the term “vector” from Ecological perspective? (1 mk)

Genetic engineering perspective.
(1 mk)

(b) State two advantages of cloning organisms. (2 mks)

8. Bivalent, synapsis and crossing over are terminologies used
(a) In reference to which stage, of which type of cell division? (2 mks)

(b) Differentiate between synapsis and synapse. (2 mks)

9. How is the mammalian trachea adapted to its function? (2 mks)
- 10.(a) Name the four portions of the human nephron that are only found in the cortex. (2 mks)
- (b) State two processes that are involved in urine formation. (2 mks)
11. (a) What is meant by the term 'ecosystem'? (2 mks)
- (b) State four abiotic factors that affect organisms in almost all ecosystems. (2 mks)
12. A certain plant was found to have 22 chromosomes in its calyx cells. State the number of chromosomes present in: (2 mks)
- (a) Embryo sac cells
- (b) Seed endosperm
13. (a) Why is glycolysis an anaerobic process? (1 mk)
- (b) State three products of glycolysis (3 mks)

14. Name the specific part of brain that triggers sweating. (1 mk)

The following table shows information on concentration of salts in the cell sap of two mature water plants A and B and the concentration of the salt in the marine water.

Plant	Conc. Of salt in PPM	
	Cell sap	Marine water
A	0.025	0.011
B	0.031	0.066

Name the process by which cells of plants A and B absorb mineral ions from the water. (2 mks)

A.....

B.....

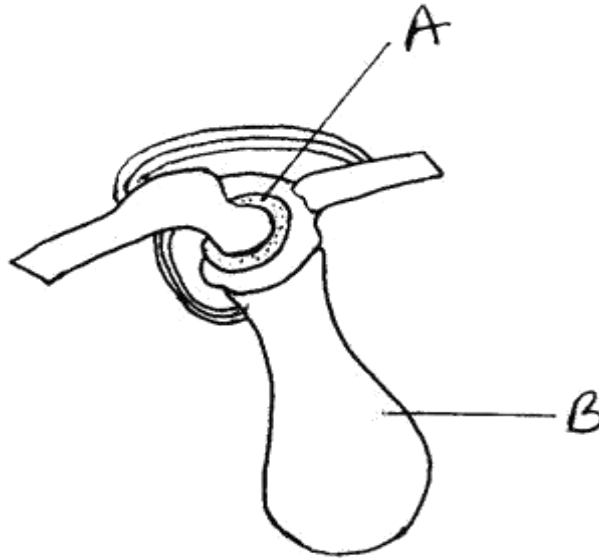
16. Name the part of the ear that carries out the following functions:

(a) Converts sound vibrations into nerve impulses. (1 mk)

(b) Converts sound waves to sound vibrations. (1 mk)

(c) Transports and amplify sound vibrations. (1 mk)

17. The diagram below represents the structure of the human shoulder joint.



(a) Name the part labeled B (1 mk)

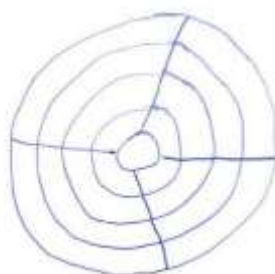
(b) State the roles played by part A. (2 mks)

State on functional differences between the above joint and the knee joint. (2 mks)

18.State one structural and one functional difference between rough endoplasmic reticulum and smooth endoplasmic reticulum. Structural difference (1 mk)

Functional difference (1 mk)

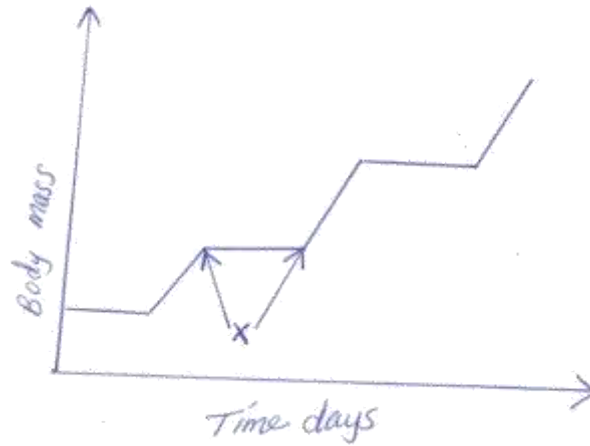
19. The diagram below shows the front view of mammalian eye.



Draw the change that would appear when a person moves from a brightly lit area to a dimly lit area. (1 mk)

(ii) Explain what causes this change. (2 mks)

20. The graph below shows growth pattern of an insect.



(a) Name the pattern growth shown. (1 mk)

Suggest what is happening to the insect at point X. Explain your answer. (2 mks)

State one advantage of metamorphosis to the life cycle of insects. (1 mk)

21.State three adaptations of the malphigian layer to its functions. (2 mks)

22.Name the parts of a seed that are formed by the following flower parts. (2 mks)

Inner integuments –

Outer integuments -

23. Name the hormones produced from the following glands. (2 mks)

(a) Corpora allata

Prothoracic glands

(a) Name one plant division that shows alternation of generations. (1 mk)

State two reasons why moss species are poorly adapted to live in terrestrial habitats. (2mks)

Name the causative agents of the following diseases:

Pneumonia -

(ii) Herpes simplex - (2 mks)

26. Mention two factors that hinder self-pollination in the flowers of monoecious plants. (2 mks)

27.(a) What is deamination? (1 mk)

(b) Explain the importance of deamination in the body (1 mk)

(c) Where is urea formed in the body? (1 mk)

PROJECTION NO. 27

NAME..... INDEX NO.....

231/1

CANDIDATE'S SIGN.....

BIOLOGY

PAPER 1

DATE.....

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **Index Number** and **School** in the spaces provided above.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper.

Additional pages **must not** be inserted.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1-22	80	

State one use for each of the following apparatus in the study of living organisms.

Pooter.(1mk)

(b) Pitfall. (1mk)

What name is given to the process that involves the following activities that take place in the nephron. of a human kidney?

(a) Removal of nitrogenous waste from the blood. (1mk)

(b) Return of useful substances back to the blood. (1mk)

3. State **two** functions of bile juice in digestion of fats. (2mks)

(a) Name a disease of the liver whose symptom is hardening and swelling of the liver. (1mk)

State the causative agent of the following diseases.

Typhoid. (1mk)

(ii) Amoebic dysentery. (1mk)

State what would happen in each of the following:

If a plant cell is placed in:

(i) A strong salt solution. (1mk)

(ii) Distilled water. (1mk)

If a red blood cell is placed in:

(i) Strong salt solution. (1mk)

(ii) Distilled water. (1mk)

State how the following factors affect enzyme activity.

- (a) Increase in temperature up to the optimum. (1mk)

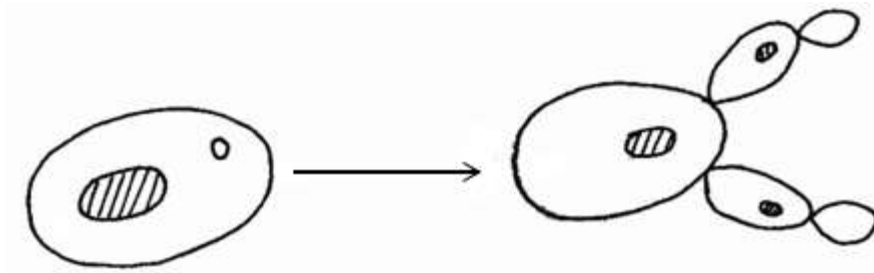
- (b) Change of PH beyond the optimum range. (1mk)

- (c) Presence of inhibitors. (1mk)

7. (a) Differentiate between a mutagen and a mutant. (2mks)

- (b) Name **two** genetic disorders caused by gene mutation. (2mks)

The diagram below shows reproduction occurring in yeast.



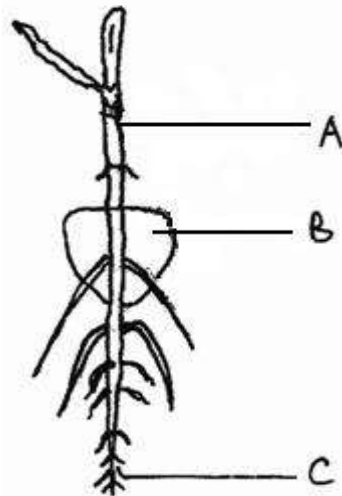
- (a) Name the type of asexual reproduction shown. (1mk)

- (b) Name an animal that shows this type of reproduction. (1mk)

- (a) Name the type of evolution involved in the development of homologous structures. (1mk)

- (b) How do convergent evolution occur? (3mks)

The diagram below represents a maize seedling.



- (a) Name the structures labelled **A** and **C**. (2mks)

A

- (b) State the functions of the parts labelled **A**, **B** and **C**. (3mks)

A

B

C

11. (a) What is oxygen debt? (2mks)

List **two** factors that determine the amount of energy a human being requires in a day. (2mks)

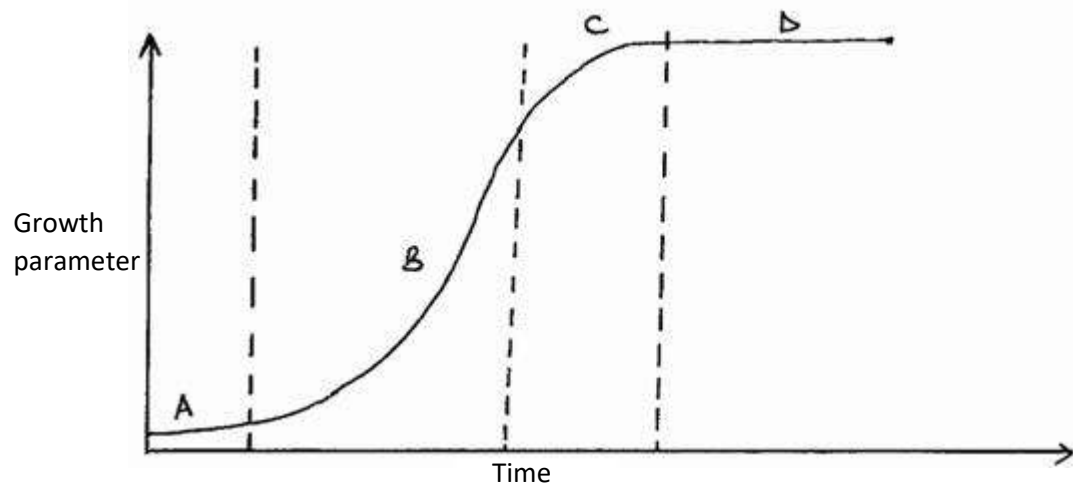
(a) A group of students visiting a National Park noted that migrations of lions were closely related to those of hyenas and vultures. Suggest a possible cause of this migration. (1mk)

(b) Explain the observation. (1mk)

(c) Name **three** methods of estimating population.

(3mks)

The graph below show the growth curve of an organism



Name the phase of growth labelled.

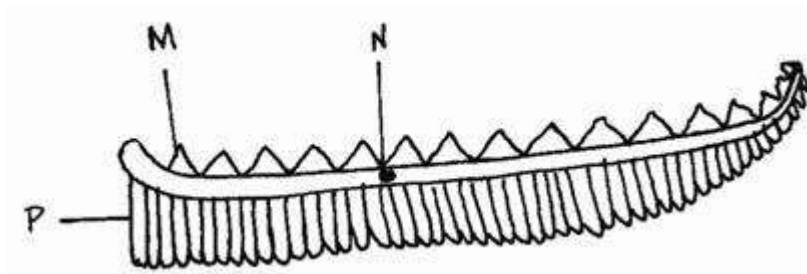
B _____ (1mk)

D _____ (1mk)

(b) Account for the growth shown in phase A.

(1mk)

The diagram below represents an organ from a bony fish. Study the diagram and answer the questions that follow.



(a) Identify the organ.

(1mk)

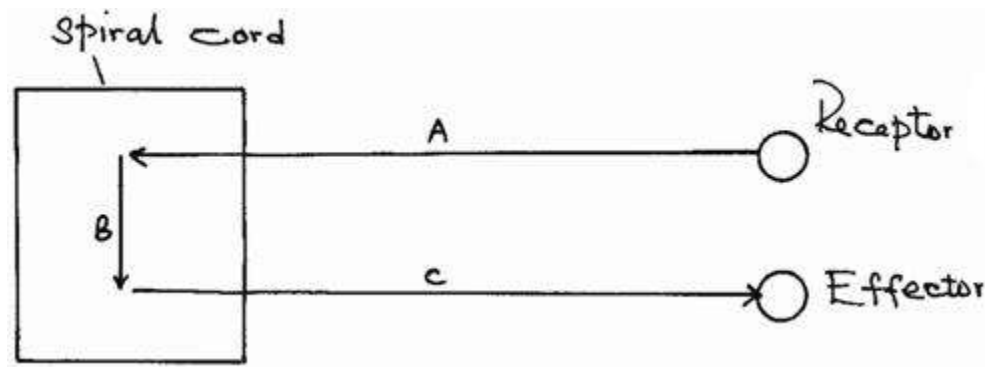
(b) How are the structures labelled P adapted to their functions. (3mks)

Name the structures that:

(a) Join bones to bones. _____ (1mk)

(b) Join muscles to bones. _____ (1mk)

16.



The diagram is a simplified part of the nervous system. Use the diagram to answer the following questions.

(a) Name the nerve cells **A** and **C**. (2mks)

A

C

A person with a spinal injury is unable to move part of the body below the injury.
Explain.(3mks)

17. (a) What is double circulatory system? (1mk)

Name **two** classes of animals which have a double circulatory system. (2mks)

18. (a) What is seed viability? (1mk)

(b) List **two** factors that determine seed viability. (2mks)

Two students were observing bacteria using two slides that were duplicates of each other.

Student A saw 10 bacteria while student B saw 50 bacteria using identical microscopes. (a)

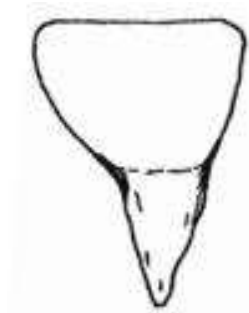
Suggest a reason why they observed different numbers of bacteria. (1mk)

(b) Which of the following combination would give a higher total magnification? (1mk)

Eye piece 10 Objective 20

Eye piece 10 Objective 40

The diagram below shows a human tooth.



(a) Identify the tooth. (1mk)

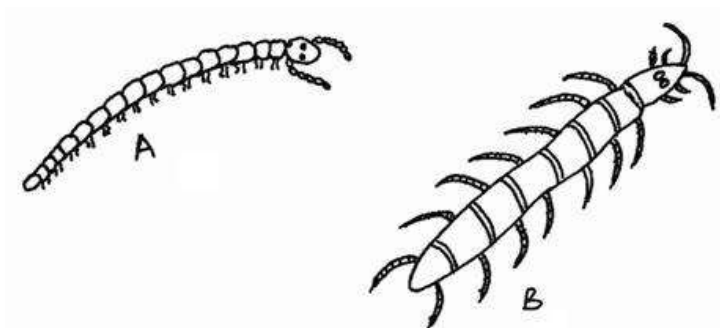
How is the tooth adapted to its function?
(1mk)

State the deficiency disease caused by lack of the following vitamins in the human body:

(i) Vitamin A. (1mk)

(ii) Vitamin D. (1mk)

The figures below show two types of animals.



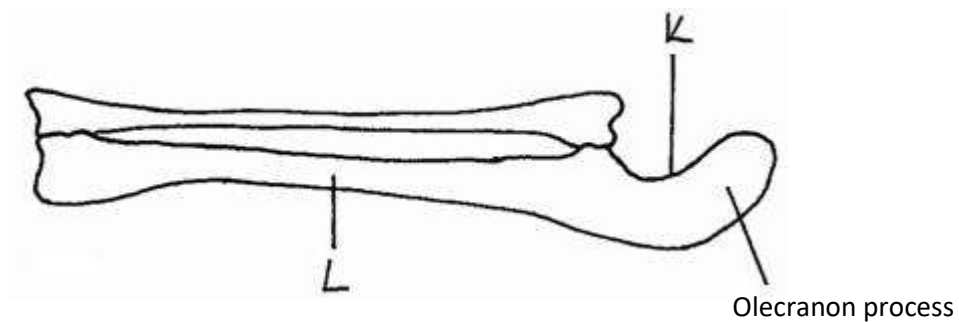
(a) Identify the phylum of the **two** organisms. (1mk)

(i) Identify **two** distinguishing characteristics which are used to put the organisms into their different classes. (2mks)

(ii) Name the classes to which the organisms belong. (2mks)

22. State **three** features in bisexual flowers that hinder self-fertilization. (3mks)

The diagram below shows the bones of the lower arm.



(a) Identify the part labelled K. (1mk)

(b) Name the bone labelled L. (1mk)

(c) What is the function of the olecranon process? (1mk)

24. (a) Define 'transpiration'. (1mk)

(b) State **two** structural factors that would favour increase in transpiration rate. (2mks)

PROJECTION NO. 28

NAME:.....INDEX NO.:.....

SCHOOL:.....CANDIDATE SIGNATURE:.....

DATE:.....

231/1
BIOLOGY
PAPER 1.
THEORY

TIME:

Instructions to candidates.

Write your name and index number in the spaces provided above.

Sign and write the examination date .

Answer all the questions in the spaces provided in the question paper.

-
1. State ways by which synaptic transmission can be stopped. (2mks)
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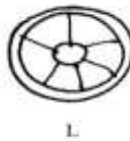
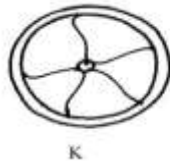
.....

- c) Name any one type of neurons. (1mk)

.....

.....

The diagram below gives an external view of the structure of the human eye observed outdoor at midday and midnight.



- a) Which diagram represents the eye as observed during the day? (1mk)

.....

.....

- b) Give a reason for your answer in (a) above. (1mk)

.....

.....

.....

A student viewed and drew a plant cell of a diameter 4mm using a light microscope whose eye piece lens was marked x1 and objective lens marked x5. How many cells were linearly arranged along the microscope's field of view whose diameter was 8mm .
(show your working) (3mks)

[illegible]

A-C-U-A-G-A-C-G

-

-

-

- Nose piece.

.....

.....

.....

i 0, C 0, Pm 3, M 3 =32.
3 1 3 3

a) Mode of feeding (1mk)

.....

.....

b) Give a reason for your answer in (a) above. (2mks)

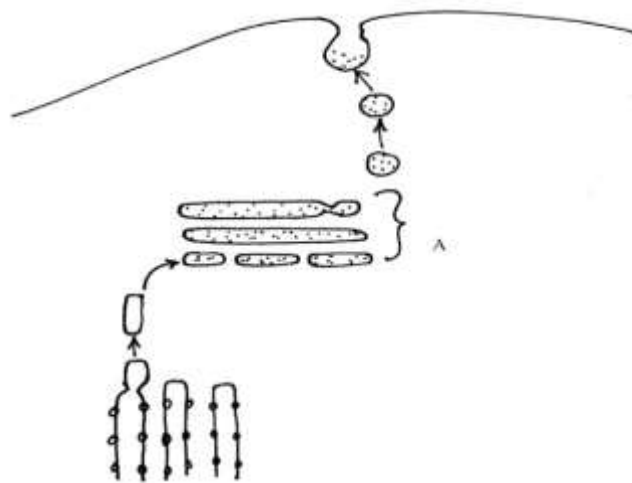
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.....

Study the diagram below and use it to answer the questions.



a) Identify the organelle marked A. (1mk)

.....

.....

.....

b) Give three functions of the organelle named in (a) above (3mks)

.....

.....

.....

.....

.....

.....

It was found that during germination of pea seeds 9.3cm^3 of carbon (iv) oxide was produced while 9.1cm^3 of oxygen was used up.

a) Calculate the respiratory quotient (RQ) of the reaction taking place. (2mks)

.....

.....

.....

.....

b) Identify the type of food substance being metabolized. (1mk)

.....

.....

Explain why Lamarck's theory of evolution is not accepted by biologists today. (2mks)

.....

.....

.....

.....

Give three reasons why plants lack complex excretory organs like those of animals (3mks)

.....

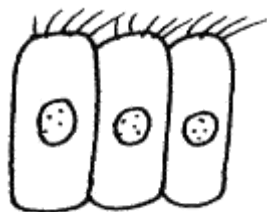
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.....

The diagram below shows a type of epithelial tissue.



What is the name of the hair-like process? (1mk)

.....a)

a)What is the function of the hair-like process. (1mk)

.....

b) Name one part in the human body where the hair-like process are found. (1mk)

.....

In an attempt to estimate the number of weaver birds in a small woodland 435 were captured , marked and released. Three days later , 620 were captured 75 of which were marked.

What is the name of the sampling method described above. (1mk)

.....

b)Calculate the approximate size of the weaver bird population in the woodland. (2mks)

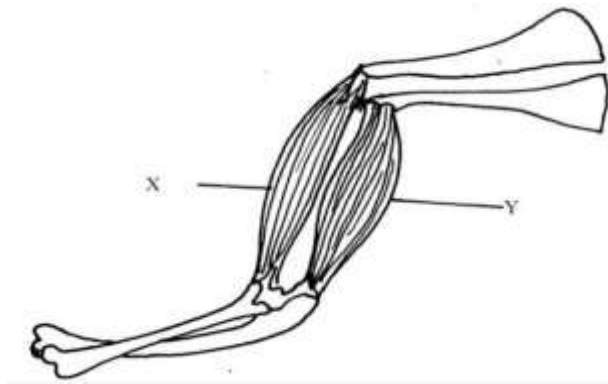
.....

c) Give one disadvantage of this method. (1mk)

.....
.....
16. Give an example of ball and socket joint. (1mk)

.....
.....
17. Name two types of strengthening tissues in plants. (2mks)

.....
.....
Study the diagram below, and answer the questions below.



a) Name the muscles labelled X and Y. (2mks)

.....
.....
b) What happens to each muscle as the arm is straightened? (2mks)

.....
.....
Nocturnal animals such as a leopard are capable of seeing fairly well at night. What two retinal adaptations have made this possible? (2mks)

The table below shows stomata distribution on leaves A and B and their surface area. Use the information to answer the questions that follow.

	Leaf A	B
Number of stomata	Upper surface 25 Lower surface 0	5 20
Surface area.	30cm ²	19cm ²

Identify with reasons the habitats of the plant from which the leaves were obtained (4mks)

Leaf A Habitat.....

Reasons.....

.....

.....

.....

Leaf B Habitat.....

Reasons.....

.....

.....

.....

A tall bean plant crossed with a dwarf one produces offspring of which about half are tall and other are dwarf . what are the genotypes of parents? Show your working

(3mks)

.....

.....

.....

.....

.....

.....

.....

22. Describe what happens during the dark stage of photosynthesis. (3mks)

.....

.....

.....

.....

.....

.....

The response exhibited by a certain plant tendril is illustrated below.



- i) Name the type of response. (1mk)

.....

.....

.....

- ii) Explain how the response named in (i) above occurs . (2mks)

.....

.....

.....

.....

.....

.....

State three adaptations of respiratory surfaces.

(3mks)



.....
.....
.....
.....
.....
.....
State the parts of the ear involved in:

a) Amplification of sound vibration (1mk)

.....
.....
.....

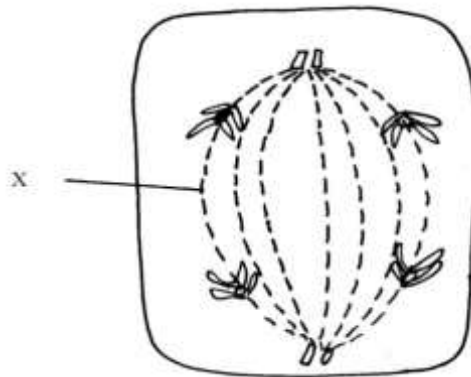
b) balance and posture. (1mk)

.....
.....
.....

26. Explain why the digestion of starch stops after food enters the stomach. (2mks)

.....
.....
.....
.....

The diagram below represents a stage during cell division.



i) Identify the stage of cell division. (1mk)

.....

.....

ii) Give two reasons for your answer (a)i) above (2mks)

.....

.....

.....

.....

iii) Name the structure labelled M. (1mk)

.....

Bivalent synapsis, crossing over are terminologies used in cell division.

a) Name the stage of meiosis in which the process takes place. (1mk)

.....

.....

b) Distinguish between synapsis and crossing over. (2mks)

PROJECTION NO. 29

NAME:INDEX NO:

SCHOOL: DATE :

CANDIDATE'S SIGNATURE:

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **School** and **Index Number** in the spaces provided at the top of this page.

Sign and write the **Date** of Examination in the spaces provided above.

Answer **ALL** questions in the spaces provided.

FOR EXAMINER'S USE ONLY

QUESTION	MAX. SCORE	CANDIDATE SCORE
1–29	80	

1. State **two** features that hinder self-pollination in plants. (2mks)

.....
.....

(a) Name the structure :

1.1.1.1 Found between two vertebrae. (1mk)

.....

1.1.1.2 That attaches muscle to bones. (1mk)

.....

(b) State **two** functions of arm of a microscope. (2mks)

.....
.....

2.0 (a) State **two** functions of cell sap. (2mks)

.....
.....

(b) State **two** functions of arm of a microscope. (2mks)

.....
.....
.....

3.0 The letter H and h represent the dominant and recessive genes for haemophilia respectively. Write down the genotype of the following:- (3mks)

3.1.1 Homozygous dominant.

.....
.....

3.1.2 Homozygous recessive

.....
.....

3.1.3 Heterozygous

.....
.....

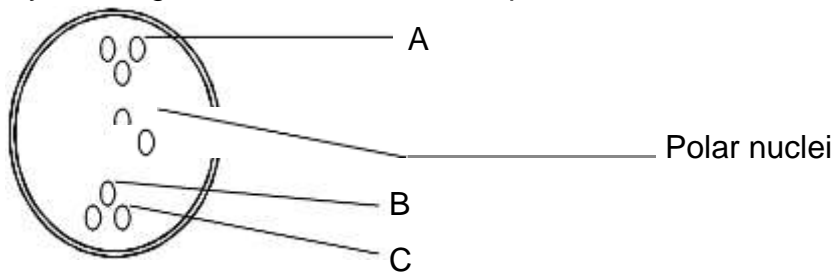
4.0 Give **two** reasons why accumulation of lactic acid during vigorous exercise leads to increase in heart beat. (2mks)

.....
.....

5.0 Sweat accumulates on a person's skin in a hot humid environment. Explain. (2mks)

.....
.....

6.0 Study the diagram below and answer questions that follows.



6.1.1.1 Name the parts labeled: (3mks)

A:.....

B:.....

C:.....

6.1.1.2 What does the part B form after fertilization? (1mk)

.....
.....

.

7.0 Explain **three** ways in which red-blood cells are adapted to their function. (3mks)

.....

.....

.....

8.0 Give the function of the following organelle:-

8.1.1 Ribosome:..... (1mk)

8.1.2 Lysosome:..... (1mk)

9.0 Three people got road accident at Kehancha and all suffered head injuries. Indicate the part of the brain each suffered by patients showing the following conditions:-

9.1.1 Loss of memory and speech. (1mk)

.....

9.1.2 Inability to maintain proper body balance and position. (1mk)

.....

9.1.3 Inability to regulate body temperature. (1mk)

.....

10.0 Name the strengthening material found in the following support tissues:

(2mks)

10.1.1 Collenchyma:.....

10.1.2 Xylem:.....

11.0 A student from St. Joseph Ntimaru made three potato strips from a fresh potato. Each strip measured 70mm. One strip was placed in solution P and the other in solution Q. The last strip was placed in an empty Petri-dish. The strip were analysed after 20 minutes and sowed the results recorded below.

Strip in solution P	Firm
Strip in solution G	Flabby
Strip in Petri-dish	Same as before

11.1.1 Account for observation recorded in strips kept in solution P and Q after 20 minutes.

11.1.1.1 In solution P (2mks)

.....
11.1.1.2 In solution Q (2mks)
.....

11.1.2 State the role of the strip kept in the empty Petri-dish for 20 minutes.
(1mk)
.....
.

12.0 (i) What is meant by vestigial structure? (1mk)
.....
.....
..

(ii) Give an example of vestigial structure in human. (1mk)
.....
.....
.

13.0 (a) State what happens during the light stage of photosynthesis. (2mks)
.....
.....

(b) State the aspect of photosynthesis that is tested using a variegated leaf. (1mk)
.....
.....

14.0 State two other gaseous exchange structures in plants beside stomata.
(2mks)
.....
.....
.....

15.0 (a) Name any two digestive enzymes that are produced in an inactive form.
(2mks)
.....
.....

Give a reason as to why the above named enzyme ???? (1mk)

.....

16.0 State **three** structural differences between DNA and RNA. (3mks)

.....
.....
.....

17.0 A group of Biology students picked an organism from the shores of the school dam. They observed and classified organisms as follows:-

KINGDOM – Animal

DIVISION – Arthropoda

CLASS – Chilopoda

17.1.1 State **two** mistakes the students made in their effort to classify. (2mks)

.....
.....
..

17.1.2 State **two** characteristics that makes millipedes different from centipedes. (2mks)

.....
.....

18.0 (a) Nitrates is the form in which Nitrogen is availed to plant. The process of breaking down Nitrates to Nitrites, Ammonia and even Nitrogen is known as: (1mk)

.....
.....

(b) List **two** adaptations of emergent hydrophytes. (2mks)

.....
.....

19.0 (a) Define the term metamorphosis. (1mk)

.....
.....
(b) Explain the role of the following hormones in insect metamorphosis. (2mks)

19.1.1.1 Moulting

hormone:.....

19.1.1.2 Juvenile

hormone:.....

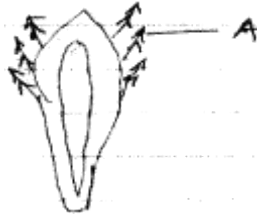
(c) State **two** adaptive advantages of larval stage.
(2mks)

.....
.....
20.0 List down **two** features that affect the rate of active transport. (2mks)

.....
.....
21.0 (a) State **two** factors that affect the rate of active transport. (2mks)

.....
.....
State **two** conditions that must be present for active transport to take place.(2mks)

.....
.....
.....
.....
.....
22.0 The diagram below is a mature fruit of dicotyledonous plant.



22.1.1 Identify part A. (1mk)

.....

22.1.2 Suggest the possible agent of dispersal. (1mk)

.....

22.1.3 What is the role of the style of flowers in the process of double fertilization.(2mks)

.....

.....

23.0 Name the major mineral element in the composition of the following:

23.1.1 Haemoglobin (1mk)

.....

...

23.1.2 Chlorophyll molecule. (2mks)

.....

...

24.0 List two functions of centriole. (2mks)

.....

.....

.

25.0 A patient whose blood group is A- negative died shortly after receive blood from a person of blood group B+ positive. Explain why. (2mks)

.....
.....

26.0 Why does the concentration of lactic acid decrease after strenuous exercise? (2mks)

.....
.....
.....

27.0 A certain plant was found to have 28 chromosomes in its petal cells. State the number of chromosomes in the plant.

(i) Egg cell in the embryo sac. (1mk)

.....

(ii) Endosperm cell. (1mk)

.....

28.0 Name the causative agent of cholera. (1mk)

.....

PROJECTION NO. 30

NAME..... INDEX NO.....

231/1

CANDIDATE'S SIGN.....

BIOLOGY

PAPER 1

DATE.....

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **Index Number** and **School** in the spaces provided above.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper.

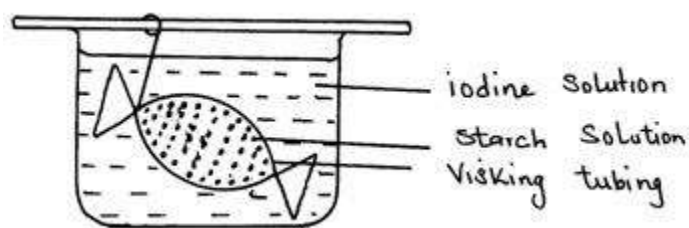
Additional pages **must not** be inserted.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1-26	80	

1. Name the gas produced during anaerobic respiration in plants. (1mk)

Study the diagram below.



- (a) Name the physiological process being investigated. (1mk)

- (b) State the observation made after some time. (1mk)

- (c) Explain the observation in (b) above. (2mks)

3. (a) State the function of phloem tissue. (1mk)

- (b) State **one** adaptation of phloem tissue to its function. (1mk)

Name and state the function of the apparatus below.
(2mks)



Apparatus

Function

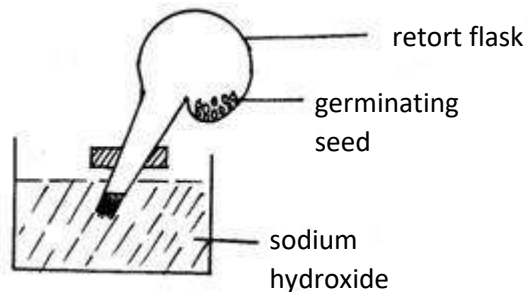
An animal has the following number of teeth four molars, two canines, six incisors and eight premolars in upper jaw. In the lower jaw there are six incisors, eight premolars two canine and six molars.

(a) Write it's dental formulae. (1mk)

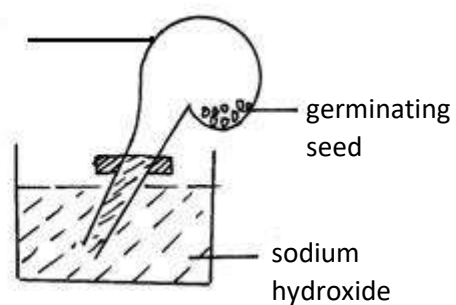
(b) State the mode of feeding of the animal above. (1mk)

The diagram below shows an experiment that was set up to investigate germinating seeds.

Beginning of experiment



End of experiment

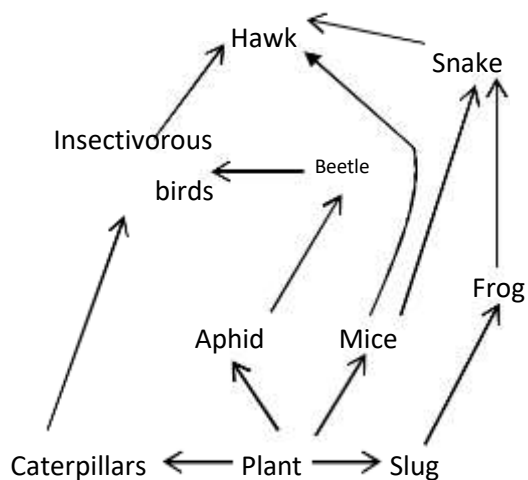


What changes are observable at the end of experiment? (1mk)

(b) Explain the change observed in (a) above. (2mks)

(c) Name the chemical process being investigated. (1mk)

Study the food web shown below and answer the questions that follow.



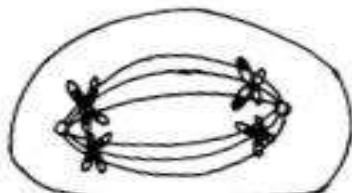
(a) Name all the organisms that occupy the second trophic level. (1mk)

(b) What is the other name of the second trophic level? (1mk)

(c) Draw a food chain that ends with hawk as a tertiary consumer. (1mk)

(d) Define the term biomass. (1mk)

The diagram shows a stage cell division. Use it to answer the questions below.



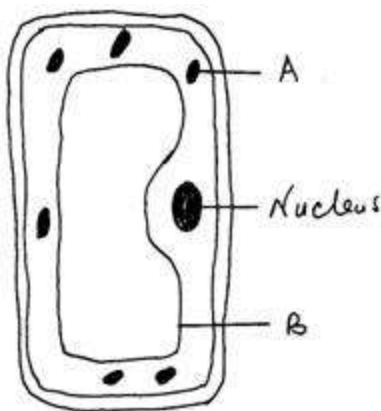
(a) Identify the stage of cell division. (1mk)

(b) Give a reason for the answer (a) above. (1mk)

9. (a) What are the expected results of a test cross. (1mk)

(b) What is meant by non-disjunction? (1mk)

The diagram below shows the structure of a plant cell as seen under light microscope.



(a) State the adaptation of structure labelled **A** to its function. (1mk)

On the diagram label the structure that controls movement of materials into and out of the cell.

(Use letter Y). (1mk)

State where the following organelles are formed in a cell.

(i) Ribosomes _____ (1mk)

(ii) Lysosome _____ (1mk)

11. (a) Define:

(i) Vestigial structures. (1mk)

(ii) Homologous structures. (1mk)

(iii) Analogous structures. (1mk)

Name **three** supportive tissues in plants.
(3mks)

Use the diagram **below** to answer the questions that follow.



- (a) Name the type of tropism exhibited by root in the diagram above. (1mk)

- (b) Name the hormone that brings about the response. (1mk)

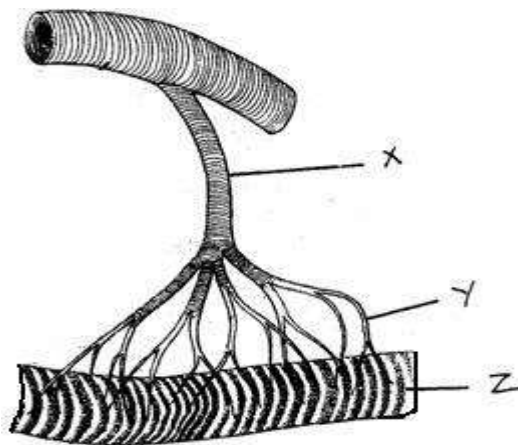
14. (a) Distinguish between epigeal and hypogeal germination. (1mk)

- (b) Define apical dominance. (1mk)

- (c) Explain the importance of apical dominance in agriculture. (2mks)

15. (a) Explain why carbon (II) oxides is referred to as a respiratory poison. (2mks)

The diagram below show a structure used for gaseous exchange in an organism.



- (a) Label parts. (3mks)

X

Y

Z

- (b) State the adaptation of part labelled Y. (1mk)

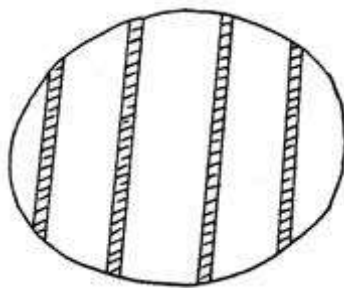
Use the diagram of (euglena) below to answer the questions that follow.



(a) Into which kingdom is euglena placed. (1mk)

(b) Name **two** other organisms placed in the same kingdom. (2mks)

The diagram below shows the field of view of a light microscope as seen by students during an experiment.



(a) Six cell were observed in the field of view. Determine the size of one cell. (2mks)

(b) Write the formula of linear magnification. (1mk)

(c) State the function of condenser in a light microscope. (1mk)

19. State **three** functions of exoskeleton. (3mks)

In an attempt to estimate the number of weaver birds in a woodland 435 were captured marked and released. Three days later 620 were captured. 75 of which were marked.

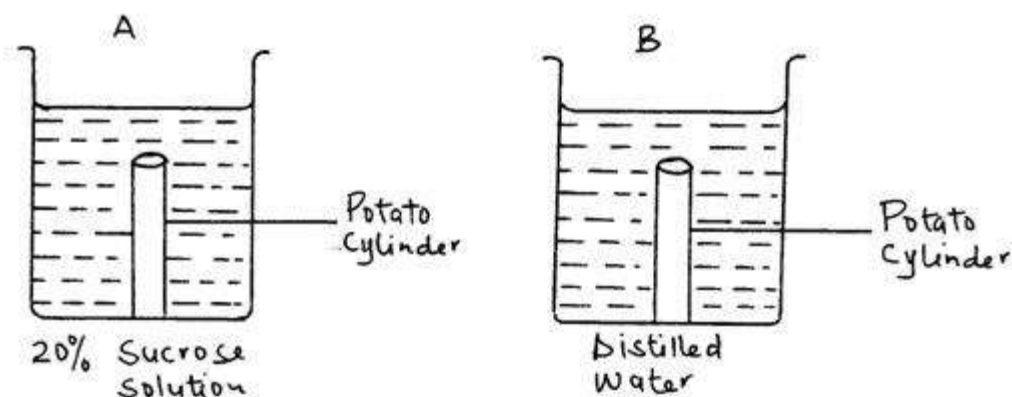
(a) Name the counting method described above. (1mk)

(b) Calculate the approximate size of weaver bird in the woodland. (2mks)

(c) State **one** assumption made during investigation. (1mk)

21. Explain continental drift as an evidence of evolution. (3mks)

Two potato cylinders were trimmed to the same size and were placed in two different solutions as shown below.



- (a) Identify the process being investigated. (1mk)

- (b) Explain the observations made after 30 minutes. (3mks)

(a) Below is a list of organisms which belong to different classes. Complete the table by naming the classes. (3mks)

Class	Organism
-------	----------

(i)		Bird
(ii)		Centipede
(iii)		Fish

(b) Define a species. (1mk)

(c) Name the causative agent of gonorrhea. (1mk)

24. (a) Name **two** hormones involved in metamorphose in insects. (2mks)

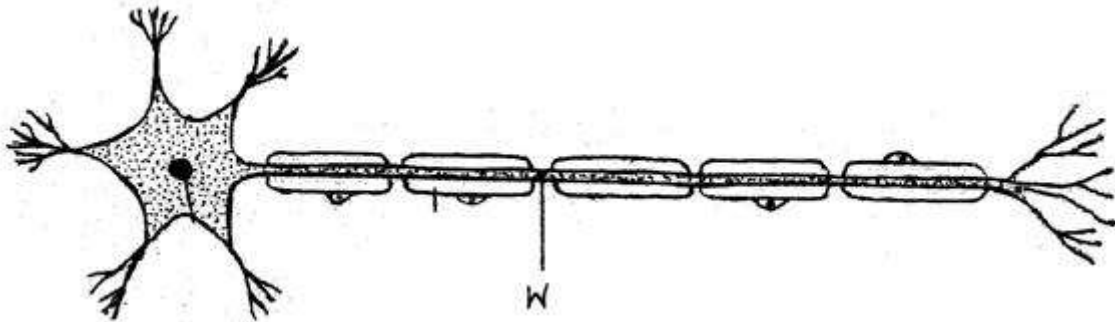
State **one** importance of each of the following in germination of seeds.
Water.(1mk)

(ii) Oxygen. (1mk)

(iii) Optimum temperature. (1mk)

25. State **three** modifications of stomata of xerophytes. (3mks)

The diagram below represents a neurone.



(a) Identify the neurone above. (1mk)

_____ State
the function of part labelled **W**. (1mk) (b)

PROJECTION NO. 31

NAME: INDEX NO:

SCHOOL: DATE :

CANDIDATE'S SIGNATURE:.....

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your name and Index Number in the spaces provided.

Sign and write the date of examination in the spaces provided.

Answer ALL questions in the spaces provided.

Wrong spelling especially of technical terms will be penalized.

FOR EXAMINER'S USE ONLY

QUESTION	MAX. SCORE	CANDIDATE SCORE
1–28	80	

1.0 Explain the term Binomial Nomenclature. (1mk)

.....
.....

2.0 Name **three** forces involved in transportation of water and mineral salts. (3mks)

.....
.....
.....

3.0 (a) Give **two** roles of DNA. (2mks)

.....
.....

(b) State the difference between DNA and RNA. (1mk)

.....
.....

4.0 Two strips A and B were cut from Tradescantia whose cell sap was 30% sugar. Strip A was placed in a solution of 10% sugar concentration while strip B was placed in 50% sugar concentration.

a) What change was expected in strips A and B? (2mks)

Strip

A:.....

.....

Strip

B:.....

.....

.

b) Account for the results in strip A. (3mks)

.....
.....
.....

5.0 State the biological significance of each of the following:

- a) Thick muscular walls and narrow lumen in arteries. (1mk)

.....
.....

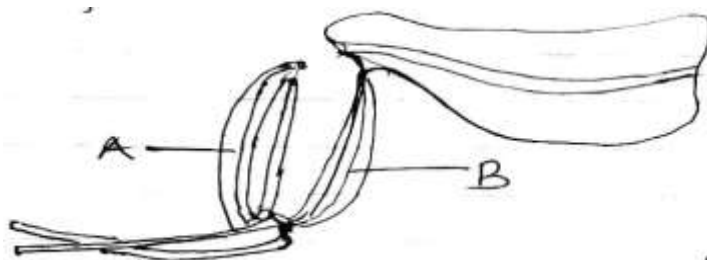
- b) Narrow xylem vessels in flowering plants. (1mk)

.....
.....

6.0 Suggest **three** reasons why green plants are included in a fish aquarium. (3mks)

.....
.....
.....

7.0 (a) Study the diagram below and answer the questions that follow.



7.1.a.1 Name the muscle labelled: (2mks)

A:.....

B:.....

7.1.a.2 What happens to each muscle as the arm is straightened? (2mks)

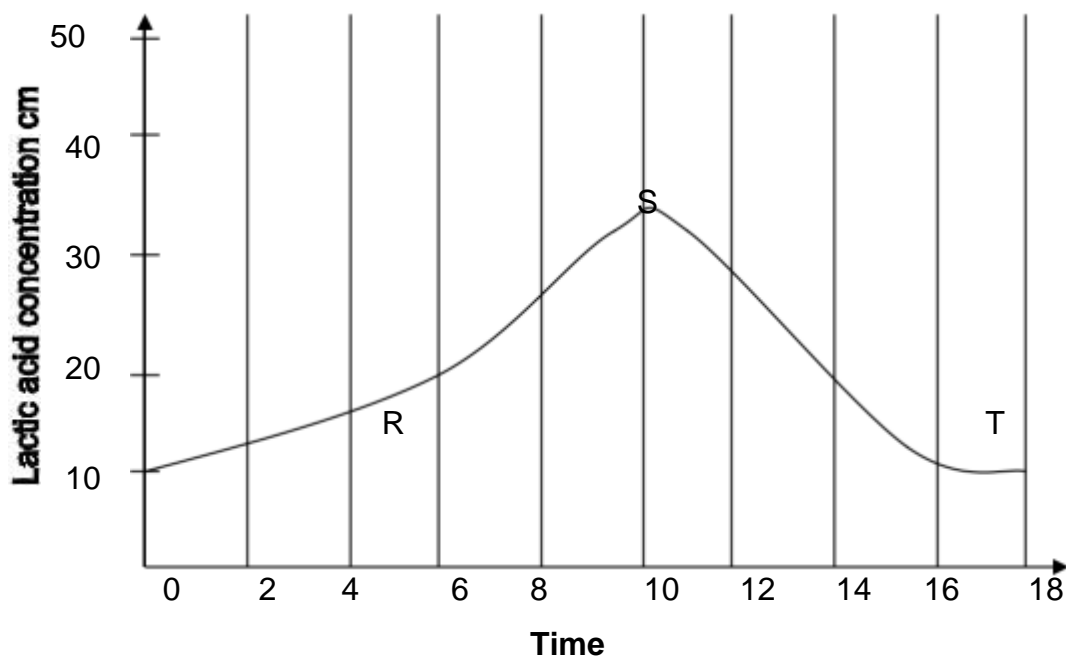
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8.0 The binomial name of housefly is MUSCA DOMESTICA.

8.1.a.1 State **two** mistakes in the way the scientific name is written. (2mks)

8.1.a.2 Re-write the name in correct manner following the rules of binomial nomenclature. (1mk)

9.0 The diagram below shows the general appearance of lactic acid in the blood of an athlete after an exercise. Study it carefully and answer the questions that follow:



(a) Name the physiological process represented by the above diagram. (1mk)

(b) Explain what happened in the body between points:

(i) R and S (1mk)

(ii) S and T (1mk)

10.0 State the use of each of the following apparatus:

10.1.a.1 Bait trap (1mk)

.....

.

10.1.a.2 Specimen bottle (1mk)

.....

.

10.1.a.3 Pitfall trap (1mk)

.....

11.0 (a) Define the term organic evolution. (1mk)

.....

.....

.....

.

(b) Give **two** examples of vestigial structures. (2mks)

.....

.....

.

12.0 (a) Distinguish between epigeal and hypogeal germination. (1mk)

.....

.....

(b) Why is oxygen necessary in the germination of seeds? (2mks)

.....

.....

13.0 (a) Digestion in the stomach involves the gastric juice, which contains mucus as one of its components. State the role of mucus in the digestion process. (1mk)

.....

.....

.

(b) Give **two** adaptations of ileum to its functions. (2mks)

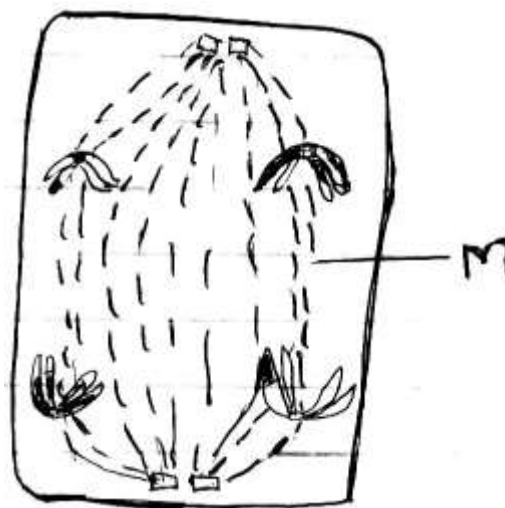
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.....

14.0 The diagram below represents a stage during cell division.



a) (i) Identify the stage of cell division. (1mk)

.....

.

(ii) Give **two** reasons for your answer to (a) (i) above. (2mks)

.....

.....

b) Name the structure labelled M. (1mk)

.....

15.0 Explain why amoeba cannot burst when placed in hypertonic solution. (2mks)

.....

.....

.....

16.0 (a) Name the organelle that is involved in each manufacture of Lipids. (1mk)

.....
(b) State **three** functions of Golgi apparatus. (3mks)
.....
.....
.....

17.0 Give the functions of the following parts of human eye:

(a) Lens (1mk)
.....
.

(b) Ciliary body. (1mk)
.....

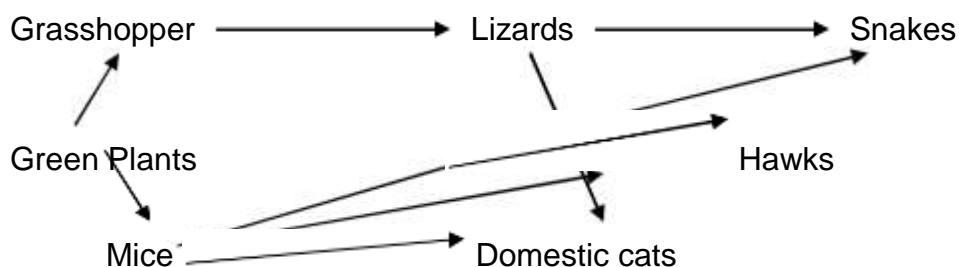
(c) Cornea (1mk)
.....
...

18.0 A shoot of seedling exposed to light on one side bends towards the source of light as it grows.

a) Name the response exhibited by the shoot of the seedling. (1mk)
.....
.

Explain how the bending towards the source of light occurs. (3mks)
.....
.....
.....
.

19.0 The chart below show s a feeding relationship in a certain eco-system.



Construct **two** food chains ending with a tertiary consumer in each case. (2mks)

b) Name **one** secondary consumers in the food web. (1mk)

.....

20.0 State the functions of the following parts of a nephron.

(i) Loop of henle (1mk)

.....

.....

(ii) Distal convoluted tubule (1mk)

.....

.....

21.0 A flower was found to have the following characteristics:

Inconspicuous petals

Long feathery stigma

Small, light pollen grains

a) What is the likely agent of pollination of the flower? (1mk)

.....

.....

What is the significance of the long feathery stigma in the flower? (1mk)

.....

.....

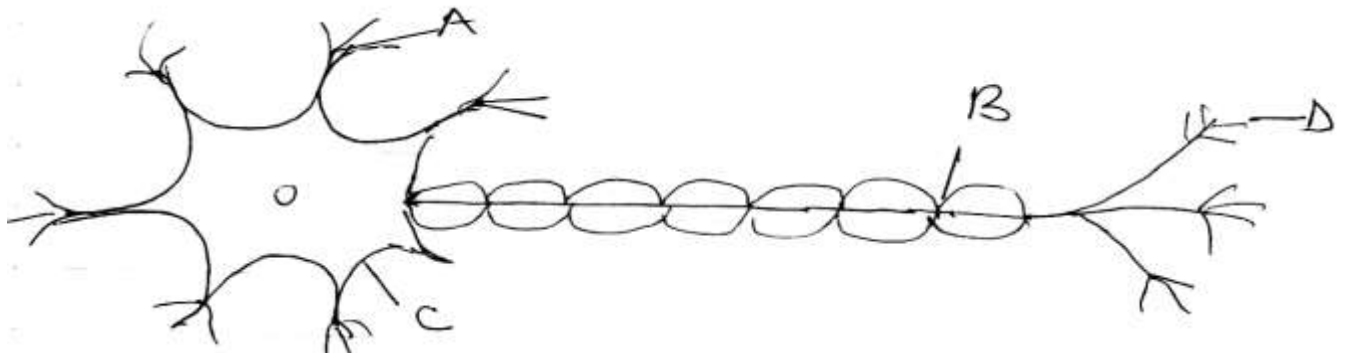
22.0 Explain how the following factors determine the daily energy requirement in humans.

a) Age (1mk)

.....
.....
b) Occupation (1mk)

.....
.....
c) Sex (1mk)

23.0 Study the diagram below and answer the questions that follow.



a) Name the parts labelled:-
(3mks)

A:.....

C:.....

D:.....

b) State the function of part labelled B. (1mk)

24.0 Most terrestrial plants do not grow well in water-logged soils. Give a reason for this. (1mk)

25.0 State the mode of a sexual reproduction exhibited by the following organisms:

25.1.a.1 Yeast (1mk)

25.1.a.2 Mushroom (1mk)

.....
26.0 Give reasons for each of the following:

(a) Constant body temperature is maintained in mammals. (2mks)

.....
.....

(b) Low blood sugar level is harmful to the body. (1mk)

.....
.....

27.0 (a) Explain what is meant by a test-cross as used in genetics. (1mk)

.....
.....

Determine the probability of a couple with blood group AB getting a child with blood group B. (Show your working).

28.0 Name the end products of the light stage of photosynthesis.
(2mks)

.....
.....

PROJECTION NO. 32

Name..... Index Number.....

Student's Signature.....

231/1

BIOLOGY

PAPER 1

2 HOURS

Instructions to Candidates

Write your name, admission number, class and signature in the spaces provided at the top of the page.

*Answer **all** the questions in the spaces provided in this paper.*

For Examiners Use Only

SECTION A	MAXIMUM SCORE	CANDIDATE SCORE
Question		
1-25	80	

1. (a) What is a test pipette used for in Biology Laboratory Lesson? (1 mrk)

.....

Give the name of a reagent that is used to test substances and at the same time used as a stain in the laboratory. (1mrk)

.....

A name of a certain garden plant is *Duranta Repens*

- i. What is the meaning of *repens*? (1mrk)

.....

- ii. Identify one mistake shown by the written name. (1 mrk)

.....

Distinguish between a *genus* and a *Species* as Taxa used during classification of the Organism. (2mrks)

.....

.....

.....

.....

.....

A form one student observing Onion epidermal cells under the low power objective counted 5 cells on a field of view measuring 5mm

- (a) Estimate the size of one cell. (1 mrk)

If the eye piece magnification used was $\times 10$ and that of the objective lens was $\times 10$. What was the magnification of the microscope? Show your working. (2 mrks)

- (c) Estimate by approximation the Number of cells that would be observed if the objective lens magnification was changed to $\times 40$ (1mrk)

.....

(d) What is the role of centriole in animal cells? (1mrk)

.....
.....

Explain the following statements:

i. The action of ptyalin stops at the stomach. (1mrk)

.....
.....

ii. The small intestines contain Villi. (1mrk)

.....
.....

iii. High temperatures stop enzyme action. (1 mrk)

.....
.....
.....

iv. Lack of magnesium leads to yellowing of leaves in plants. (2 mrks)

.....
.....
.....

v. The thyroid glands swell, in some individuals (1 mrk)

.....
.....

Name one cofactor and one co-enzyme required for a blood clotting process to be normal.

a) Co-factor - (1mrk)

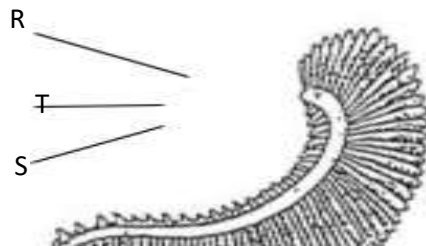
b) co-enzyme - (1mrk)

6. What is counter current Mechanism in a Tilapia fish? (2mrks)

.....
.....
.....

7. State three adaptations of the Red blood cell to its function. (3 mrks)

The diagram below represents an organ from a finned bony fish. Study it and answer the question that follows



- i. Identify the organ. (1mrk)
- ii. State three adaptations of the part labeled S to its functions. (3 mrks)
9. (a) State the importance of pleural fluid in the lung of a mammal. (2mrks)

What function does the cilia of the trachea play during gaseous exchange in a mammal? (1 mrk)

What significance does mucus offer a mammal during gaseous exchange? (1 mrk)

The equation below represents a process that take place in plants and animals



(a) Name the process. (1 mrk)

State two requirements necessary for the process (a) above to process at maximum rate. (2 mrks)

(a) What is the role of Cristae in the process above? (1 mrk)

In which part of the cell does glycolysis and Krebs cycle occur? (2 mrks)

Glycolysis -

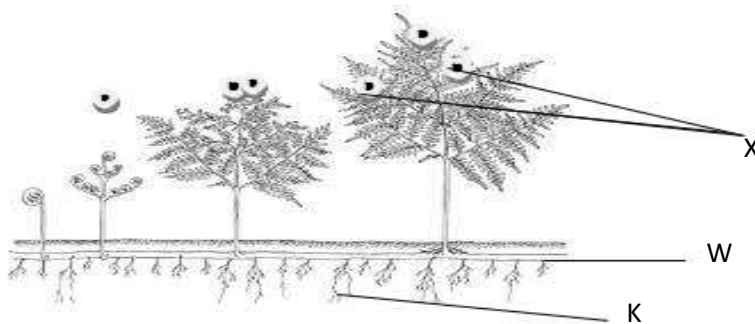
Krebs cycle -

State the role of each of the following components of the skin. (2 mrks)

Sebum.....

Melanin.....

Study the diagram below and answer the questions that follows



- i. Name parts. (2mrks)

.....

K

Name the division of Kingdom plantae the diagram represent. (1 mrk)

.....

- iii. Give the identity of **X** and state its function (2 mks)

Identify of X

Function -

12. State three Biotic factors in an ecosystem. (3 mks)

.....

Name two specific bacteria involved in denitrification process in a Nitrogen cycle.

(2 mrks)

.....

Define:

- (a) Biosphere (1 mrk)

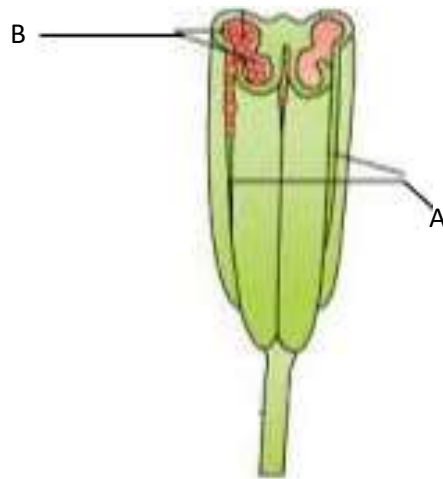
.....

- (b) Ecological Niche (1 mrk)

.....

.....

The diagram below represents a male reproductive transverse section structure in plant



i. Name structures (2mrks)

A -

B-

ii. Name the type of cell division taking place in structure A (1 mrk)

.....

iii. State Two significance of the named type of cell division in (ii) above in Sexual Reproduction. (2mrks)

.....

.....

17. State Three applications of Genetic in our day to day life. (3 mrks)

.....

.....

.....

18. Give the full Name of the abbreviation. DNA (1 mrk)

.....

19. State the Three theories advanced to support the origin of life. (3 mrks)

.....

.....

.....

20. Name three types of Fossils

(3 mrks)

.....

.....

.....

Name a chemical substance required for transmission of impulse in a synapse. (1 mrk)

.....

.....

.....

State the functions of the following structures in neuron.

i. Node of Ranvier (1 mrk)

.....

ii. Myelin sheath (1 mrk)

.....

Name the chemical substances involved in thickening of the following support tissues in plants

..... (1mrk)

.....(1mrk)

State the Number of the following vertebra in a mammal

i. Cervical Vertebrae (1mrk)

.....

ii. Lumbar Vertebrae (1mrk)

.....

State three functions of Obturator Foramen in the pelvic girdle in a mammal.

(3mrks)

.....

.....

.....

.....

.....

What is a

tendon?(1mrk)

.....

(ii) ligament?

(1 mrk)

.....

PROJECTION NO. 33

NAME:..... INDEX NO:.....

SCHOOL:..... DATE:.....

SIGN:.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided at the top of this page.

Sign and write the date of examination in the spaces provided above.

Answer all the questions.

Answers must be written in the spaces provided in the question paper.

Additional pages must not be inserted.

This paper consists of 12 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

FOR EXAMINERS USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE

1. Name the causative agent of the following diseases in man (2mks)

candidansis

.....

Syphilis

.....

A student observed an organelle using an electron microscope at magnification of X600. Its diameter has 2 millimeters. Calculate the actual diameter of the organelle in micrometers.
(2mks)

3. State two ways by which lactic acid formed in the muscles of an athlete is removed (2mks)

.....
.....

4. (a) Name the blood vessels that connect arteries to veins (1mk)

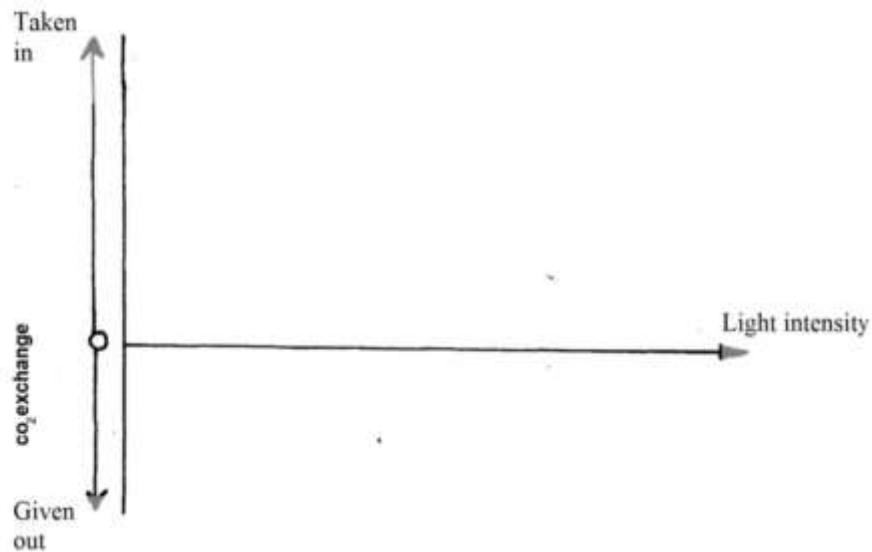
.....

Explain three ways in which the vessels named in

(a) above are adapted to carry out their function. (3mks)

.....
.....
.....

The figure below shows the effect of light intensity on the exchange of carbon (IV) oxide between a plant leaf and the atmospheric air.



- (a) What name is given to point X? (1mk)

.....

.....

Name two physiological processes in which carbon (IV) oxide is involved at point X? (2mks)

.....

.....

6. State where each of the following is found in the human skeleton (2mks)

- (a) Olecranon

.....

- (b) Glenoid cavity

.....

Explain why people living at high altitude have higher concentration of red blood cells and haemoglobin than people who live at lower altitude (2mks)

.....

.....

.....

.....

State the survival value of ;

(a) Negative phototaxis in fly larvae (2mks)

.....

(b) Thigmotropism (1mk)

.....

Using the symbol 'B' for black for allele in mice and 'D' for grey coloured for allele, write down the genotype of a mouse that is:

Heterozygous for colour

.....

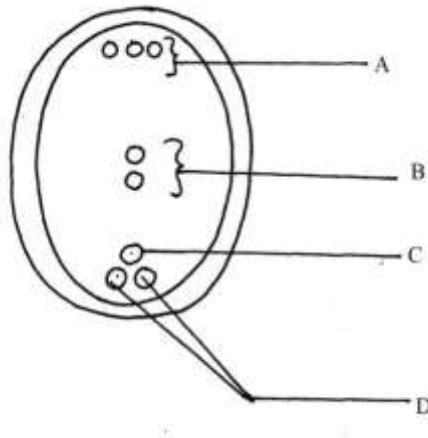
.....

Homozygous recessive

.....

.....

The diagram below shows a mature embryo sac of a flowering plant



- (a) Name the parts labelled (3mks)

A.....

D.....

- (b) What is the function of structures labelled B? (1mk)

.....

- (a) State two ways in which the human body is naturally protected against harmful bacteria (2mks)

.....

.....

State one way in which the composition of blood in the pulmonary artery and that in pulmonary vein (1mk)

.....

Describe how the following parts of the mammalian ear are adapted to their functions

Pinna

.....

.....

Tympanic membrane

.....

.....

13. State the necessity of support in plants (3mks)

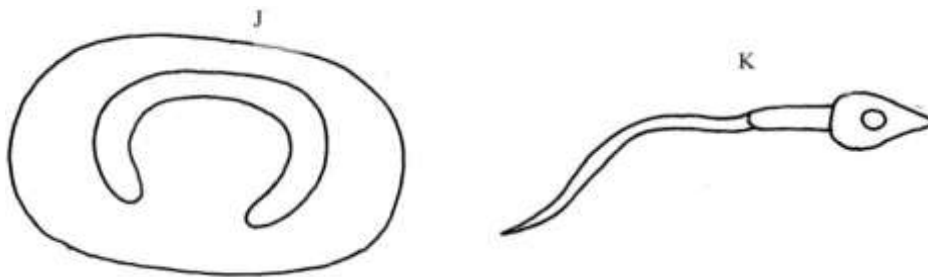
.....

.....

.....

.....

Below are diagrams of specialised cells in mammals



- (a) Identify each of the cells (2mks)

J.....

K.....

- (b) Explain how cell specialization has enabled cell K to be effective in its functions (2mks)

.....

.....

15. (a) State one similarity between diffusion and osmosis (1mk)

.....
.....
(b) State two roles of active transport in higher plants (2mks)

.....
.....
(a) A light microscope is an important apparatus in a laboratory. State two precautions which should be taken when storing (2mks)

.....
.....
(b) State functions of the following parts on a microscope (2mks)

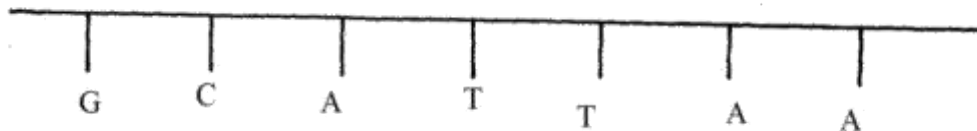
Fine adjustment knob

.....
.....
Condenser

.....
.....
17. (a) Name the hormone responsible for moulting in insect (1mk)

.....
.....
(b) Where is the hormone named in (a) above secreted in insects (1mk)

.....
.....
The figure below represents a section of a certain nucleic acid



(a) (i) Identify the type of nucleic acid from which this strand was obtained. (1mk)

.....

Give a reason for your answer in a (i) above

(1mk)

.....

.....

(b) State two structural differences between the RNA and DNA (2mks)

.....

.....

What assumptions are made while using capture and recapture method in estimating population(2mks)

.....

.....

.....

.....

A count for osmoregulatory changes that would take place in a marine amoeba if it was transferred to a fresh water environment (3mks)

.....

.....

.....

.....

.....

21. (a) What is metamorphosis (1mk)

.....

.....

(b) What is the biological importance of the larval stage during metamorphosis (2mks)

.....

.....

.....

A solution of sugar cane was boiled with dilute hydrochloric acid. Sodium hydrogen carbonate was added and then heated with Benedicts' solution .An orange precipitate was formed

(a) Why was the solution boiled with dilute hydrochloric acid (2mks)

.....

.....

.....

(b) To which class of carbohydrates does sugar cane belong? (1mk)

.....

23. (a) What is organic evolution (1mk)

.....

.....

(b) State two ways through which fossils serve as evidence for organic evolution (2mks)

.....

.....

(a) State the advantage of desert animals excreting their nitrogenous waste in form of urea and not ammonia (3mks)

.....

.....

.....

.....

.....

.....

(b) State two modifications on the kidney nepron of desert mammals (2mks)

.....

.....

Consider the characteristics of the following organisms: bee, tick, lobster, cockroach, millipede, moth and mosquito.

(a) Give the name of the phylum to which all these organisms belong. (1mk)

.....

(b) State three distinctive features of members of the phylum named in (a) above (3mks)

.....

.....

.....

26. Explain how the following lower the rate of transpiration in plants (2mks)



Hairs on the leaf

.....

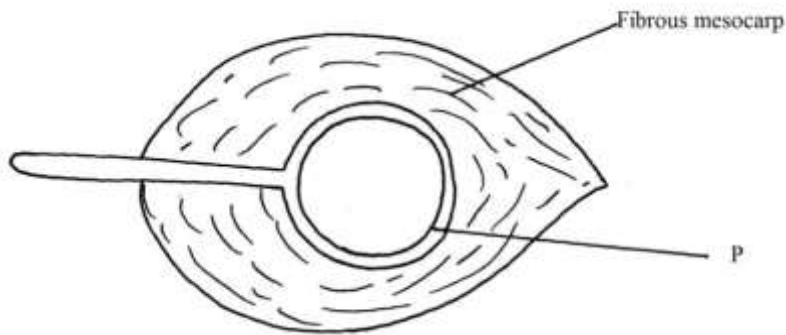
.....

Folding of the leaf

.....

.....

The diagram below represents a longitudinal section of a fruit



- (a) Name structures labelled P (1mk)

.....

- (b) Describe two adaptations of the fruit for its mode of dispersal (3mks)

Mode of dispersal

.....

.....

Adaptation

.....

.....

.....

PROJECTION NO. 34

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided at the top of this page.

Sign and write the date of examination in the spaces provided above.

Answer **all** the questions.

Answers must be written in the spaces provided in the question paper.

Additional pages must **not** be inserted.

FOR EXAMINERS USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
	1-31	80	

Answer ALL questions in the spaces in this paper

1. Name two components of blood that are not present in glomerular filtrate. (2mks)

i).....

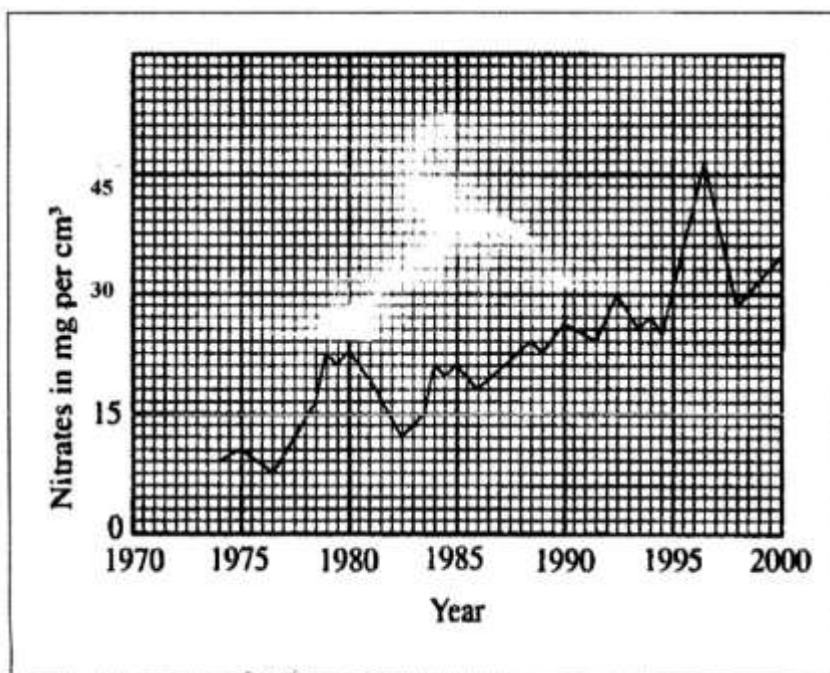
ii).....

State the difference between photosynthesis and chemosynthesis.

(2mks)

.....
.....

Use the graph below to answer the question that follow.



Calculate the difference in nitrate concentration between the highest and lowest.

(1mk)

b) How can increase in nitrate concentration in the river lead to death of fish? (2mks)

c) Suggest two possible sources of nitrate that lead to the pollution in river.

4. a) What is meant by the term binomial nomenclature. (1mk)

.....
.....

A dog is called *Canis familiaris*. Name the taxonomic unit represented by *canis*. (1mk)

5. a) State the phylum where all members have open circulatory system. (1mk)

.....

Explain the advantages of closed circulatory system over open circulatory system.

(2mks)

.....
.....
.....
.....

The following is an equation representing a type of respiration



- a) Identify the type of respiration. (1mk)

.....

- b) Suggest one industrial application of the process name in (a) above. (1mk)

.....

State two features of leaves which enable a plant to reduce the loss of water.

.....

.....

Name the cell organelles responsible for :

Protein synthesis

.....

Destroying worn – out organelles and cells

.....

..

a) Lietego school biology student used a microscope with x40 objective lens and x5 eye

piece lens which had 2mm radius. Calculate the area of the field of view in micrometers
(2mks)

- b) What is the average size of the cell in micrometers (2mks)

.....

.....

.....

.....

10. Give two functions of the exoskeleton in arthropods. (2mks)

.....

.....

.....

.....

11. a) Name the site of gaseous exchange in mammals. (1mk)

.....

.....

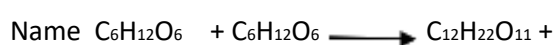
b) State one characteristics of the site named in (a) above. (1mk)

i).....

ii).....

iii).....

The chemical equation below represents a physiological process that takes in living organisms



Q

i) the process R (2mks)

.....

substance Q

.....

13. a) Distinguish between homologous and analogous structures in evolution (2mks)

.....

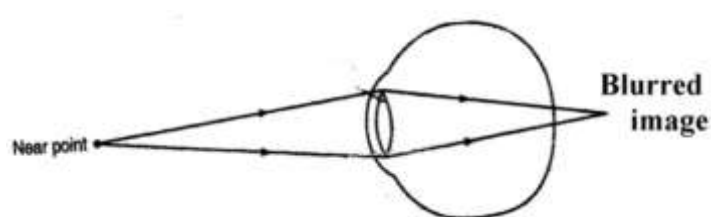
.....

.....
.....

b) Give an example of a vestigial structure in human beings. (1mk)

.....

The illustration below represents an eye defect.



a) Name the eye defect (1mk)

.....
.....

b) How can the defect be corrected? (1mk)

.....
.....

15. Name two classes of phylum arthropoda with cephalothor.

i).....

ii).....

iii).....

16. State three roles of placenta during pregnancy. (3mks)

i).....

ii).....

iii).....

Name the part of an ovule that develops into each of the following parts of a seed after fertilization.

(2mks)

Testa

.....

Endosperm

.....

Explain how the following tissues are adapted to provide mechanical support in plants

a) Collenchyma (2mks)

.....

.....

Sclerenchyma

.....

.....

Two equal strips A and B were from a potato whose cell was 30% of sugar. The strip A was placed in a solution of 10% sugar concentration while strip B was placed in 50% sugar

Concentration

a) What change was expected in strips A and B? (2mks)

A

.....

B.....

b) Account for the change in strip A. (2mks)

.....

.....

When shoots of young plants were exposed to unidirectional source of light, they bend towards light.

- a) Name the type of response exhibited by the young shoots. (1mk)

.....

- b) Explain the cause of the observation above. (3mks)

.....

.....

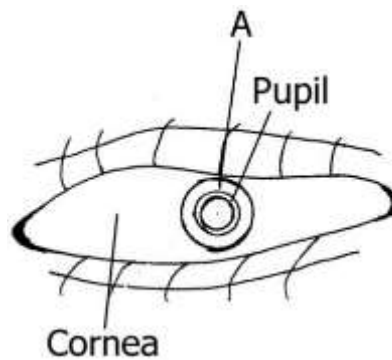
.....

.....

.....

.....

Study the drawing and answer the questions below.



- a) Name the part labelled.A (1mk)

.....

- b) Describe the changes that occur in the structure A in dim light. (2mks)

.....

.....

.....

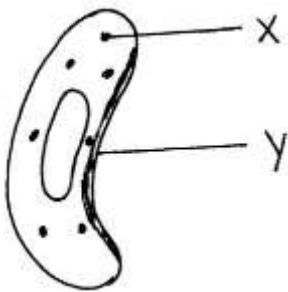
- c) What is mean by the term accommodation with reference to the eye? (1mk)

.....
.....

State any three factors that can influence reduction in the population of herbivores in a national part.

- i)
- ii)
- iii)

The diagram below represents a cell



- a) Name the parts labelled

X.....

Y.....

- b) State the role of the cell

(1mk)

.....
.....

25. Name the hormone responsible for:

(2mks)

osmoregulation

.....

reabsorption of mineral salts.

.....

A man of blood group A (heterozygous) marries a woman of blood group O. What are the possible blood groups of their children?

(2mks)

.....

.....

.....

.....

The diagram below represents a bone obtained from the hind limb of a goat.



- a) Identify the bone (1mk)

.....

- b) Name the type of joint formed at the part labelled T. (1mk)

.....

During germination and early growth the dry weight of endosperm decreases while that of the embryo increases. Explain.

(2mks)

.....

.....

.....

.....

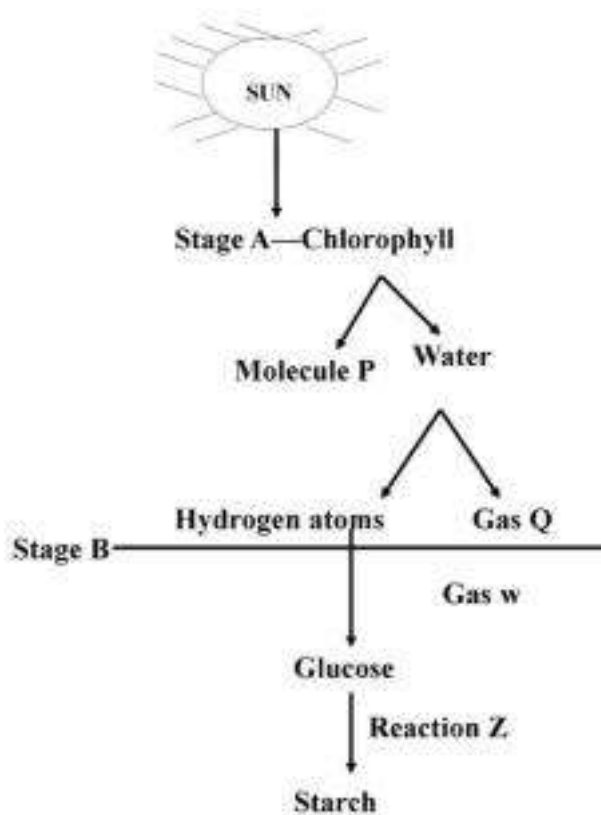
.....

.....

29. State one structural different between the sensory neurone and motor neurone. (1mk)

Below is a diagrammatic summary of the main biochemical events in photosynthesis.

Study it carefully and answer the questions that follow.



- a) Suggest the identify of molecule P. (1mk)

Name the gases represented by the letters

Q

W

Name the specific site for the reactions in stage B

.....

d) Name reaction Z. (1mk)

Z

i) Give two examples of gene mutation traits in human beings . (2mks)

i)

iii)

PROJECTION NO. 35

NAME:.....INDEX

SCHOOL:.....SIGNATURE.....

DATE.....

231/1

BIOLOGY

PAPER 1

(Theory)

TIME: 2HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided.

Answer ALL the questions in the spaces provided,

FOR EXAMINERS USE ONLY

Question	Maximum score	Candidates score
1-27	80	

1. **Explain** the following terms.

a) Taxonomy (1mrk)

.....

.....

b) Species (1mrk)

.....

.....

.....

2. State **three** features used in classifying arthropods into classes. (3mrks)

.....

.....

.....

.....

a) **Name** the substance that accumulates in muscles when respiration occurs with insufficient Oxygen.(1mrk)

.....

.....

b) Give the **three** end products of anaerobic respiration in plants. (3mrks)

.....

.....

.....

.....

4. a) State **three** characteristics of a wind pollinated flower. (3mrks)

.....

.....

.....

.....

b) **Explain** why sexual reproduction is important to organisms. (1mrk)

.....

.....

5. **State** the functions of the following organelles.

a).Lysosomes (1mrk)

.....

b).Golgi apparatus (1mrk)

.....

6. What is the role of vascular bundles in plant nutrition? (3mrks)

.....

.....

.....

.....

Haemophilia is a genetic disorder which is transmitted through a recessive gene linked to the X chromosome. Using **H** to represent the normal gene and **h** for haemophilia, work out the genotypic ratio of the offspring of a marriage between a woman who is carrier for haemophilia gene and a normal man. (4mrks)

8. a) In what form does energy enter the earth's ecosystem? (1mrk)

.....

b) What is the main source of energy in an ecosystem (1mrk)

.....

.....

c) In what form does energy transferred from one trophic level to another? (1mrk)

.....

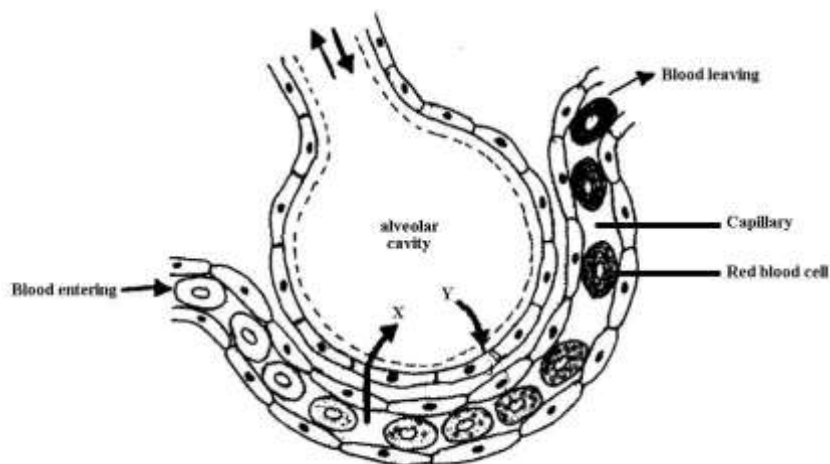
.....

d) If only a small fraction of energy is transferred from one trophic level to another, what happens to the rest of the energy? (1mrk)

.....

.....

9. The diagram below represents gaseous exchange in the alveolus.



a). Identify the gases labeled X and Y. (2mrks)

.....

.....

.....

b). Trace the path followed by gas Y from alveolar space until it reaches the red blood cells. (3mrks)

.....

.....

.....

c). **Name** the part of the brain that controls breathing movement in humans. (1mrk)

.....

10. The table below shows the energy use per day in kilojoules

Age(years)	Male	Female
2	5,500	5,500
5	7,000	7,000
8	8,800	8,000
11	10,000	9,200
14	12,500	10,500
18	14,200	9,600
25	12,100	8,800

a).From the table, explain why after age 8 males require more energy than females. (1mrk)

.....

.....

.....

b). Other than sex and age, name **three** other factors that determine energy requirements in human beings (3mrks)

.....

.....

.....

.....

11. a) Define organic evolution. (1mrk)

.....

.....

.....

b). Give the role played by variation in the process of evolution. (2mrks)

.....

.....

.....

.....

12. a) What are halophytes? (1mrk)

.....
.....
.....
b) **State three** adaptations of halophytes to their habitats. (2mrks)

.....
.....
.....
.....
.....
13. a) **Name** the causative agent of the following diseases in humans. (2mrks)

Syphilis.....

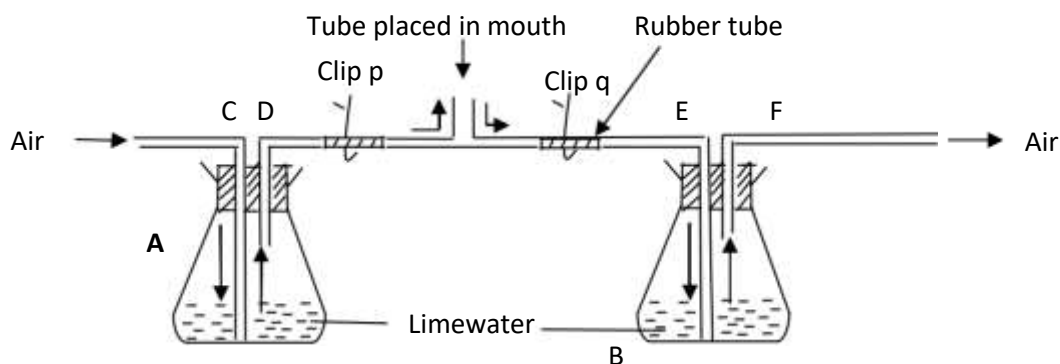
Herpes.....

b). State the functions of the following structures. (2mrks)

Fallopian tube.....

Amniotic fluid.....

14. An experiment was set up as shown below to compare the amount of carbon (iv) oxide in expired and inspired air.



a). **State** the purpose of the clip

(2mrks)

i).

P.....

ii).

Q.....

b). Compare the observations in flask A and B after the experiment. Give reasons for your answer. (2mrks)

.....
.....

15. **Name** the form in which carbohydrates are stored in.

(2mrks)

i). Plants tissues

.....

ii). Animal tissues

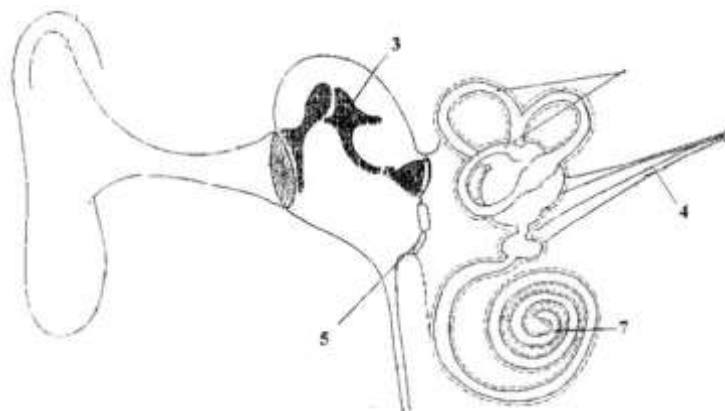
.....

16. **Explain** how water is gained from the soil by root hairs in plants.

(3mrks)

.....
.....
.....
.....

17. The diagram below shows the human ear.



a). Name the structures labeled 3, 4

(2mrks)

.....
.....
.....
b). **State** the function of the parts labeled 5 and 7. (2mrks)

.....
.....
.....
18. Give the survival value of the following tropic responses

a). Geotropism (1mrk)

.....
.....
.....
b). Haptotropism (1mrk)

.....
.....
.....
c). Chemotropism (1mrk)

.....
.....
.....
19. Distinguish between **single** and **double** circulatory systems. (1mrk)

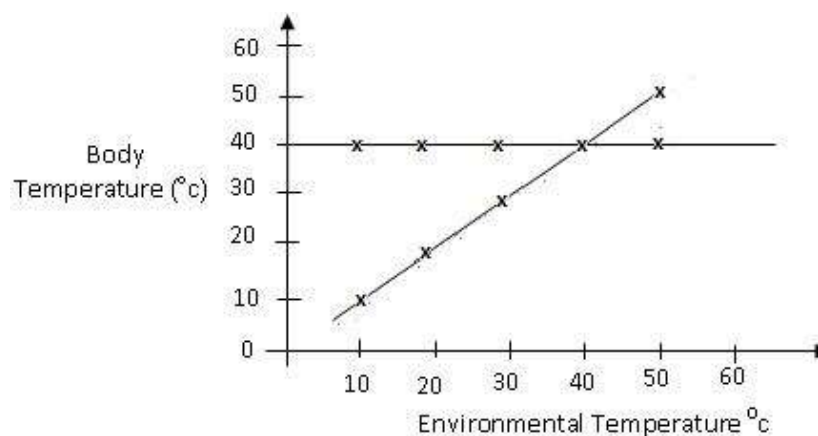
.....
.....
.....
20. Name **one** disorder caused by a dominant gene. (1mrk)

.....
.....
21. Name the spore producing structures in pteridophytes. (1mrk)

.....
.....
22. a). Define transpiration. (1mrk)

.....
.....
b). State **two** environmental factors that decrease the rate of transpiration. (2mrk)

.....
.....
The graph below shows the relationship between environmental temperature and the body temperature in two different animals A and B.



a). **State** the relationship between the body temperature of animal A and external environmental temperature. (1mrk)

.....
.....
b). Give the term used to describe;

i). Animals of type A

.....(1mrk)

ii). Animals of type B

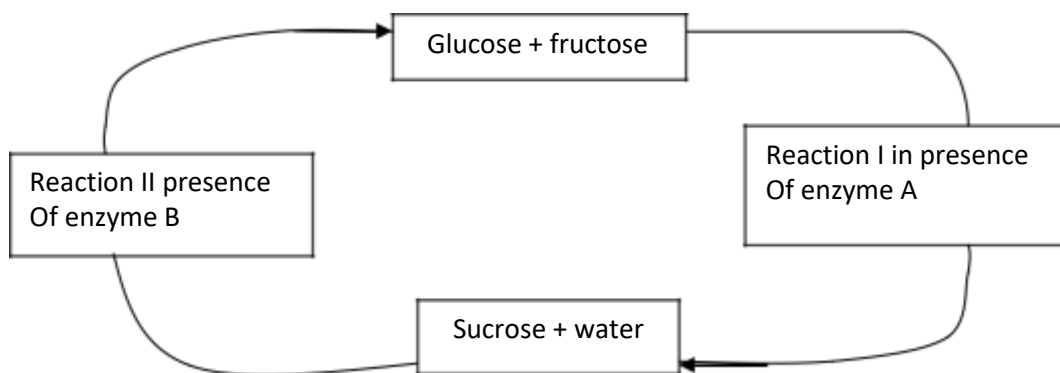
.....(1mrk)

Nitrogen in the atmosphere cannot be directly utilized by plants. **State two** ways by which this

Nitrogen is made available for plant use. (2mrk)

.....
.....
.....

The diagram below shows chemical reaction I and II which are controlled by enzyme A and B.



Name the reaction I and enzyme B (2mrks)

Reaction

I.....

Enzyme

B.....

26. **State two** main functions of a microscope. (2mrks)

.....
.....
.....
.....

in what form is carbon (IV) oxide transported in
blood. (2mrks)

.....
.....
.....
.....

PROJECTION NO. 36

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

SIGN:.....

231/1

BIOLOGY

PAPER I

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1–28	80	

Some form one students wanted to collect the following animals for study in the laboratory.

State the suitable apparatus they should use.

i) Flying insects (1 mark)

.....

ii) Crawling stinging insects (1 mark)

.....

iii) Small animals from tree barks (1 mark)

.....

2. a) State the role of enzyme catalase in living cells (2 mark)

.....

.....

b) Which factor inactivates enzyme action? (1 mark)

.....

.....

State the transport and synthetic roles of endoplasmic reticulum

i) Transport role (1 mark)

.....

.....

ii) Synthetic role (1 mark)

.....

.....

4. a) What is test cross? (1 mark)

.....

.....

b) What are homologous chromosomes? (1 mark)

.....

.....

5. a) What is the significance of diffusion to plant pollination (1 mark)

.....

.....

- b) Explain why movement of air molecules is not energy driven process (1 mark)

.....

.....

6. a) Name two products of anaerobic respiration in animals (2 mark)

.....

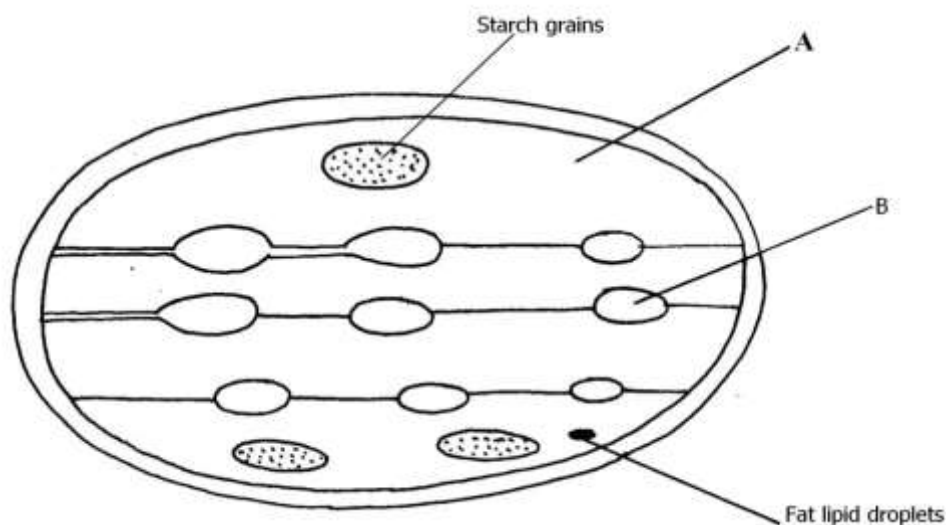
.....

- b) Define the term respiratory quotient (1 mark)

.....

.....

7. Study the diagram below and answer the questions that follows (1 mark)



- a) Identify the structures labeled A and B (2 mark)

.....

.....

b) What process takes place in the parts labeled A and B (2 mark)

.....

.....

.....

8. State two distinguishing characteristics of members of division Bryophyta (2 mark)

.....

.....

.....

9. Name the organisms that cause: (2 mark)

Malaria

.....

Sleeping sickness

.....

10. a) Differentiate between transpiration and guttation (2 mark)

.....

.....

.....

b) State two conditions that are necessary for opening of the stomata (2 mark)

.....

.....

.....

11. State two functions of smooth muscle along alimentary canal in mammals. (2 mark)

.....

.....

.....

12. List the three modes of expressing food relationship in an ecological system (3 mark)

.....

.....

.....

13. a) What is eye accommodation? (1 mark)

.....

.....

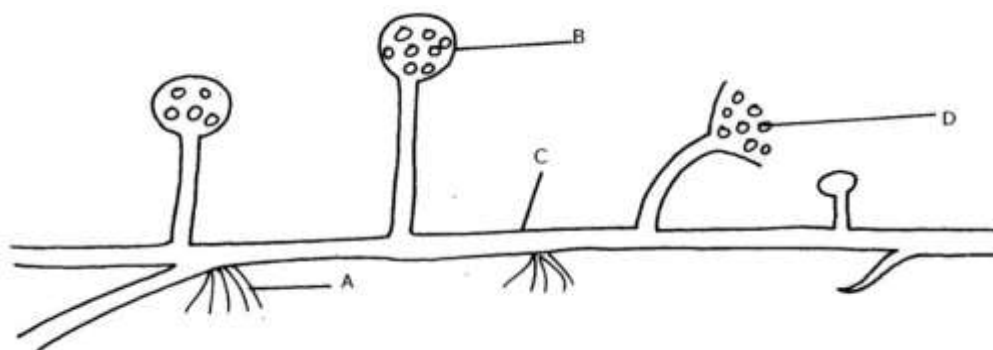
Explain how the iris muscle controls the size of pupil when exposed to bright light. (2 mark)

.....

.....

.....

The figure below shows part of a mould growing on a substrate



- a) Name the kingdom to which it belong (1 mark)

.....

b) Name the parts labeled B, C, and D (3 mark)

.....

.....

.....

.....

c) State the function of part A (1 mark)

.....

.....

Explain the effects of vigorous exercise on

a) Breathing rate (1 mark)

.....

.....

b) Pulse rate (1 mark)

.....

.....

c) Arterioles of a person (1 mark)

.....

.....

16. a) Distinguish between pyramid of numbers and pyramid of biomass (2 mark)

.....

.....

.....

.....

Briefly describe how the belt transect can be used in estimating the population of a shrub in a grassland (2 mark)

.....

.....

.....

.....

a) State two advantages which a constant body temperature gives mammals and birds over the animals (2 mark)

.....

.....

.....

.....

b) How does the body size affects heat loss in an animal (1 mark)

.....

.....

A cross between a black bull and a white cow produces a calf which has black and white spots.

a) State the type of dominance shown. (1 mark)

.....

.....

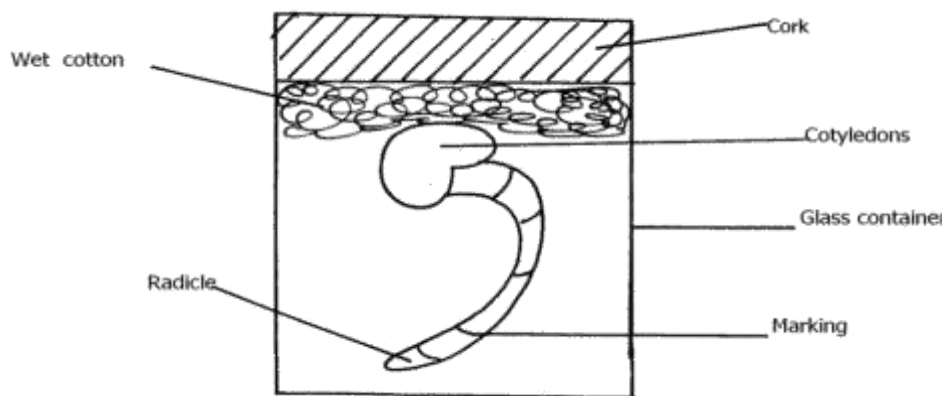
Suggest the possible genotypes of the calf if the genes for white and black trait are B and W respectively. (1 mark)

.....

.....

.....

A student set up an experiment as shown in the diagram below.

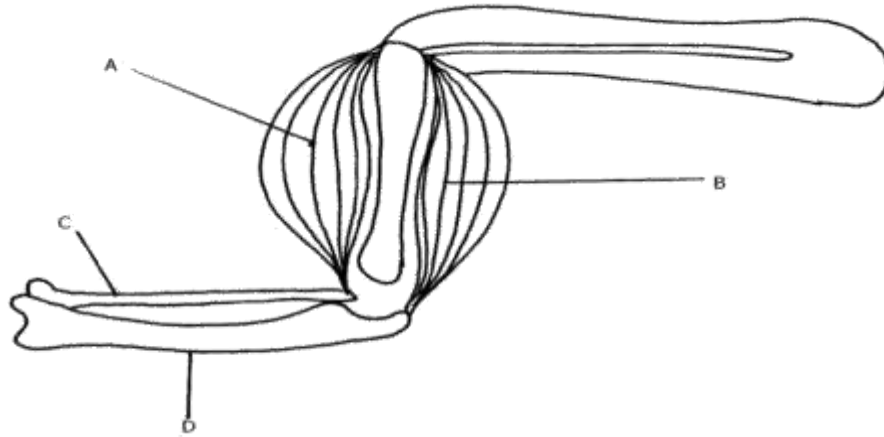


a) What was the aim of the experiment? (1 mark)

.....
 ...

b) On the diagram below indicate the expected results after three days. (2 mark)





- a) Name the bones labeled C and D. (2 mark)

.....

.....

- b) What happens to structure A and B as the arm is straightened (1 mark)

.....

.....

21. a) What are the vestigial structures? (1 mark)

.....

.....

- b) Give two examples of the structures above in man. (2 mark)

.....

.....

.....

.....

22. a) What is seed dormancy? (1 mark)

.....
.....
b) Name a growth inhibitor in seeds (1 mark)

.....
.....
c) Differentiate between hypogeal and epigeal germination in seeds (2 mark)

.....
.....
.....
.....
The diagram of the Nucleolus of a liver cell of a rat in an electron micrograph was 8.0 mm.
Calculate the actual diameter of the Nucleolus in micrometers given the magnification was
X16000. (2 mark)

.....
.....
.....
.....
a) Explain why tracheids are not efficient in transporting water up the plant. (1 mark)

.....
.....
b) What is the advantage of xylem vessels being dead? (1 mark)

.....
.....
An accident victim was found to pass large volumes of dilute urine.

a) What part of the brain was injured? (1 mark)

.....

.....

Explain how injury of the part mentioned in 25(a) above brought about release of large volume of urine. (3 mark)

.....

.....

.....

.....

.....

The following nucleotide sequence was AGCCT on a segment of DNA strand.

i) Write down the sequence in corresponding segment of DNA strand (2 mark)

.....

.....

.....

Find the complementary strand from the original sequence of RNA.(1 mark)

.....

.....

27. a) Define the term active transport (1 mark)

.....

.....

.....

Name two environmental factors that influence the rate of active transport.(2 mark)

.....
.....

28. State three unique features of a class insect. (3 mark)

.....
.....
.....
.....

PROJECTION NO. 37

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

231/1

BIOLOGY

PAPER I

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

Candidates check the question paper to ascertain that all the papers are printed

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1-32	80	

1. What components of blood are absent in the tissue fluid (2mks)

.....

.....

2. (a) What is a cell. (1mk)

.....

.....

Define the meaning of the following terms

Entomology(1mk)

.....

.....

- (ii) Genetics (2mks)

.....

.....

3. (a) Name the association between leguminous plant and rhizobium bacteria (1mk)

.....

.....

- (i) State the population estimation method of grasshoppers in your school compound (1mk)

.....

.....

.....

- (ii) Suggest the name of the formula used to calculate population of the grasshoppers.

.....

.....

State the organelles that would be abundant in

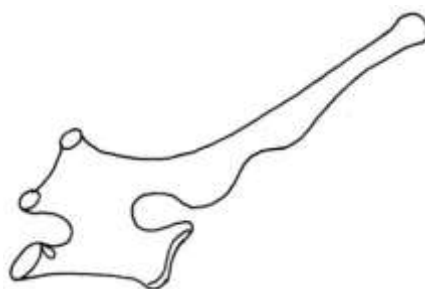
- (a) Palisade cell (2mks)

.....

Skeletal muscle cell

.....

The diagram below represents a mammalian vertebra.



- (a) Identify the vertebra represented above. (1mk)

-
- (b) Give a reason for your answer. (1mk)
-

State the functions of;

- (a) Rough Endoplasmic Reticulum (1mk)
-

.....

(b) Centrioles (1mk)

.....

.....

State any three theories that explain the mechanism of opening and closing of stomata. (3mks)

.....

.....

.....

The following are characteristics of a certain animal dentition; large curved and sharply

Pointed canines, small closely fitting incisors, narrow molars and premolars with cusps

(i) Identify the likely mode of feeding in this animal (1mk)

.....

.....

State three adaptations of the three types of teeth to the mode of feeding identified in

(i) above(3mks)

.....

.....

.....

.....

A student visiting a game park observed that an adult elephant flapping its ears twice as much as its calf in order to cool its body when it is hot. Explain (2mks)

.....

.....

.....

.....

Name one function of,

Progesterone(1mk)

.....

.....

(b) Luteinizing hormone (1mk)

.....

.....

11. (a) Distinguish between the terms transpiration and Guttation (2mks)

.....

.....

.....

.....

(b) State the structures through which each of the process named in (a) above occurs (2mks)

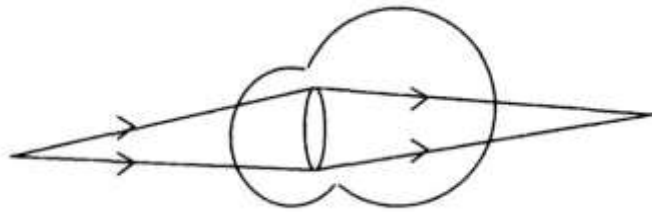
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.....

The diagram below shows the position of an image formed in a defective eye.

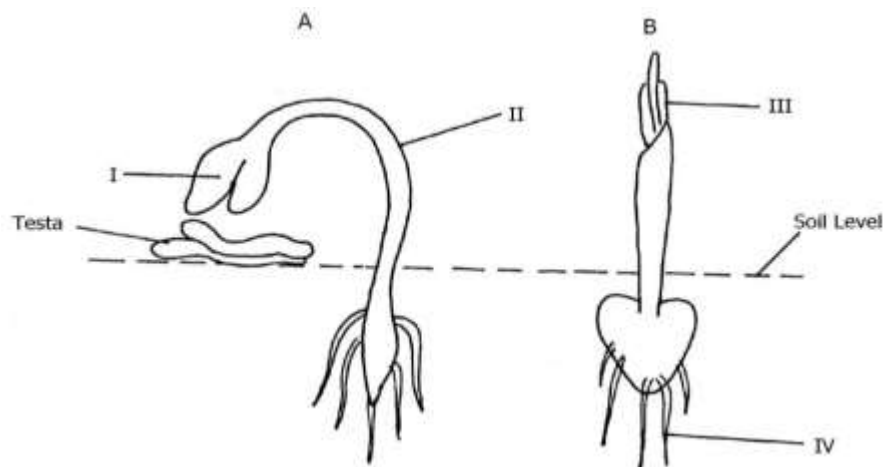


(a) Name the defect..... (1mk)

Explain how the defect name in (a) above can be corrected (1mk)

.....

The diagram below represents a stage of growth in two different seedlings.



(a) Identify the type of germination exhibited B. (1mk)

.....

(b) State the functions of part labeled I and IV. (2mks)

.....

IV

14. (a) State the part of the brain that controls breathing movements in man (1mk)

.....

.....

- (b) Explain how the aquatic plants are adapted to gaseous exchange (4mks)

.....

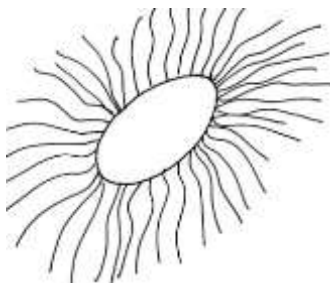
.....

.....

.....

.....

The diagram below shows a seed of a certain plant.



- (a) Name the likely agent of dispersal. (1mk)

.....

- (b) Give a reason for your answer. (1mk)

.....

16. (a) Distinguish between taxon and taxonomy (2mks)

.....

.....

- (b) Name two classes of the phylum Arthropoda that have cephalothorax (2mks)

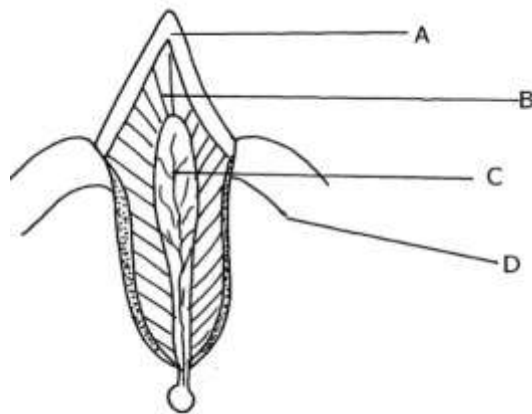
.....

.....

17. (a) Name the source of hydrochloric acid in the mammalian stomach. (1mk)

.....

The diagram below represents internal structure of a mammalian tooth.



- (c) Name part labeled B and D (2mks)

B.....

D.....

18. Distinguish between gene and chromosomal mutation. (2mks)

.....

.....

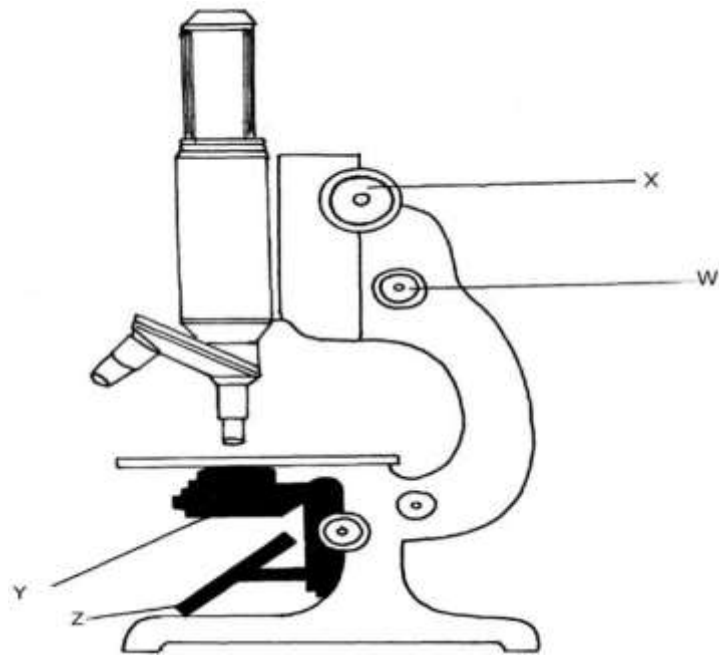
19. Differentiate between intracellular and extracellular enzymes. (2mks)

.....

.....

.....

The diagram below represents a common laboratory equipment.



- (i) Label the parts labeled X and Y. (2mks)

.....

Y.....

- (ii) Using arrows show how the object is illuminated. (2mks)

21. What is the main functions of vascular bundles. (2mks)

.....

State the stage in meiosis where the following take place

- (a) Disappearing of nucleolus (1mk)

.....

- (b) Formation of new spindle fibres (1mk)

.....
(c) Formation of separate cells each with haploid number of chromosomes (1mk)

.....
Explain the following genetic terms

(a) Turner's syndrome (2mks)

.....
.....
.....
(b) Deletion (2mks)

.....
(c) Name one sex-linked trait carried in they chromosome (1mk)

.....
24.(a) What is meant by organic evolution (1mk)

.....
State three limitations in use of fossil records in retracting the evolutionary history
of all modern day organisms (3mks)

.....
.....
.....
25. Differentiate between monoecious and dioecious plants (2mks)

.....

.....

26. State three advantages of metamorphosis to the life of insects (2mks)

.....

.....

.....

State the function of the following apparatus

(a) a pooter (1mk)

.....

.....

(b) a pit fall trap (1mk).

.....

.....

28. (a) Distinguish between Natural and acquired immunity (1mk)

.....

(b) (i) Define the term Allergy (1mk)

.....

(ii) List two causes of allergy in humans (2mks)

.....

PROJECTION NO. 38

Name..... Index No...../.....

School.....Date

Candidate's Signature.....

231/1

BIOLOGY

(THEORY)

Paper1

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number and the Name of your school in the spaces provided above.

Sign and write the date of examination into each space provided above

Answer ALL the questions in the spaces provided.

State the functions of the following points of a light microscope.

Diaphragm(1mk)

.....

Condenser(1mk)

.....

State the functions of the following organelles.

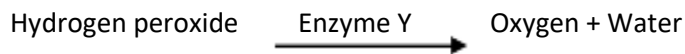
Nucleolus(1mk)

.....

Ribosomes(1mk)

.....

The reaction represented by the equation below occurs in the body.



(a) Name enzyme Y. (1mk)

.....

(b) Name an organ in the body where the reaction occurs. (1mk)

.....

(c) What is the significance of the reaction (1mk)

.....

.....

4. (a) Name two disorders in man that occur through gene substitution (2mks)

.....

.....

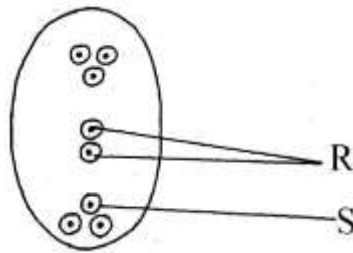
(b) Give two advantages of polyploidy in plants. (2mks)

.....

.....

.....

Study the diagram of the embryo sac below and answer questions that follow.



- (a) Name the type of fertilization that occurs in the embryo sac. (1mk)

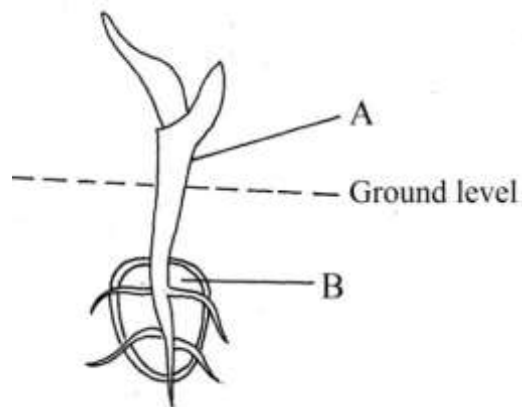
.....

- (b) What do the structure labelled R and S develop into after fertilization. (2mks)

R.....

S.....

The diagram below represents a maize seedling



- (a) (i) Name the type of germination exhibited by maize. (1mk)

.....

(ii) Give a reason for your answer in (a) (i) above. (1mk)

.....

(b) State the functions of the parts labelled A and B. (2mk)

A.....

B.....

(a) Explain how the following factors control population.

Predation(1mk)

.....

.....

Competition(1mk)

.....

.....

Parasitism(1mk)

.....

.....

A cat was used to control the population of rats.

(i) What term is used to refer to this method. (1mk)

.....

(ii) State one advantage of using the method you named in (i) above. (1mk)

.....

State the role played by the following substance in digestion.

(i) Hydrochloric acid (2mks)

.....

.....

(ii) Bile salts (2mks)

.....

.....

The chemical equation below represent a reaction that occurs in cels.



(i) Calculate the respiratory quotient (RQ) (2mks)

.....

.....

.....

.....

.....

(ii) Identify the substrate used in the reaction. (1mk)

.....

Give two reasons why the substrate you have identified in 9. (ii) above is not the
not the main respiratory substrate. (2mks)

.....

.....

.....

Explain what happens in humans when the concentration of glucose in the blood

decreases below normal level. (4mks)

.....

.....

.....

.....

11. State two adaptations of the alveolus to its functions. (2mks)

.....

.....

12. (a) Explain the role of oxygen in Active transport (1mk)

.....

.....

- (b) Name two processes that depend on Active transport in animals (2mks)

.....

.....

.....

Name support tissues in plants thickened with:

Cellulose(1mk)

.....

Lignin(1mk)

.....

14. State three biological importance of tropisms in plants (3mks)

.....

.....

.....

.....

15. (a) What are Analogous structures? (1mk)

.....

(b) Give two examples of Homologous structures (2mks)

.....

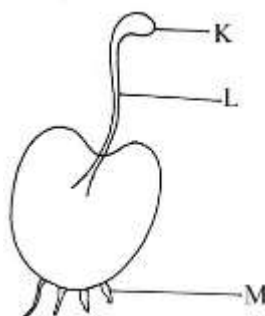
16. State three limitations of fossil records as an evidence of organic evolution (3mks)

.....

.....

.....

Study the diagram below and answer questions that follow



(a) State the division the organism belongs (1mk)

.....

(b) Name the parts labelled K and L (1mk)

K.....

L.....

(c) What is the function of the part labelled M. (1mk)

M.....

Explain the role of the following hormones in reproduction.

Progesterone(2mks)

.....

.....

Oestrogen(2mks)

.....

.....

19. State two factors that hinder self-pollination and fertilization. (2mks)

.....

.....

.....

A mango tree is known as mangifera Indica

- (a) Identify two mistakes made in the writing of the name (2mks)

.....

.....

- (b) What is the scientific naming called? (1mk)

.....

State three methods that could be used to determine the diet of wild animals in an ecosystem(3mks)

.....

.....

.....

.....

22. State two ways in which chloroplasts are adapted for photosynthesis (2mks)

.....

.....

.....

Name joints formed between the:

(a) Humerus and scapula (1mk)

.....

(b) Cranial bones (1mk)

.....

State the role of the following chemicals in a test for non-reducing sugar.

(i) Hydrochloric acid (1mk)

.....

(ii) Sodium hydrogen carbonate (1mk)

.....

Name two chemical compounds that are protein in nature that regulate metabolic

activities in the body (2mks)

.....

.....

.....

26. State three environmental factors that increase the rate of transpiration. (3mks)

.....

.....

.....

.....

27. Carbon (II) oxide is a respiratory poison. Explain (3mks)

.....

.....

.....

.....

.....

.....

.....

PROJECTION NO. 39

Name..... Index No.....

School..... Candidate's sign.....

Date.....

231/1

BIOLOGY

Paper 1

2 Hours

INSTRUCTIONS TO CANDIDATES.

Answer all the questions in the space provided

For examiners use only:

Questions	Max score	Candidates
1-27	80	

State the function of the following cell organelle

Ribosome(3mks)

.....
.....

Smooth endoplasmic reticulum

.....
.....

Golgi apparatus

.....
.....

2. List any distinguishing features of the class arachnida (2mks)

.....
.....

3. (a) (i) Name the hormone responsible for moulting in insects (1mk)

.....

Where is the hormone in a(i) above secreted

.....
.....

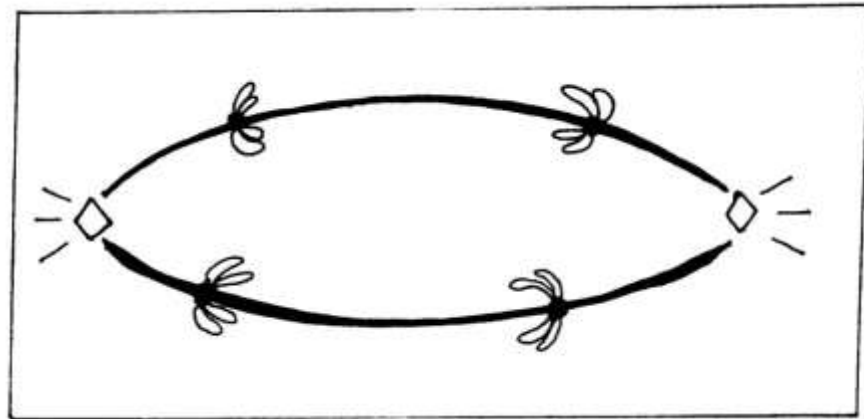
- (b) State the role of juvenile hormone in the development of insect (1mk)

.....

4. State three functions of the mammalian blood other than transport (3mks)

.....
.....
.....

Below is a stage in cell division



(a) Identify the stage (1mk)

.....

(b) Give reasons for your answer (2mks)

.....

.....

Industrial wastes may contain metallic pollutants. State how such pollutants may indirectly reach and accumulate in the human body if the wastes were dumped into rivers. (3mks)

.....

.....

.....

.....

Name parts of the brain which control

(a) Involuntary activities e.g breathing (1mk)

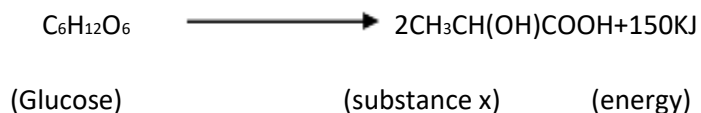
.....

.....

- (b) Control voluntary body movement (1mk)

.....

During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles



- (a) What is the name of this process (1mk)

.....

- (b) Name the substance X (1mk)

.....

- (c) What happens to the muscle if x accumulates to critical level (1mks)

.....

9. (a) What is meant by (a) organic evolution (1mk)

.....

.....

- (b) Adaptive radiation (1mk)

.....

.....

Identify the type of mutation represented by the following pairs of words

- (i) Shirt instead of skirt (1mk)

.....

- (ii) Hopping instead of shopping (1mk)

.....

(iii) Eat instead of tea (1mk)

.....

State the function of the following in reproduction

(a) Umbilical cord (3mks)

.....
.....

Aerosome

.....
.....

Follicular stimulating hormone

.....
.....

(a) Explain why a person discharges urine more frequently when environment temperatures are low than when they are high. (2mks)

.....
.....
.....

(b) Name the nitrogenous wastes excreted by a fresh water fish (1mk)

.....

Explain why individuals with smaller sizes requires more energy per kg of body weight than those with large sizes (3mks)

.....
.....
.....
.....

14. List three types of muscles (3mks)

.....

.....

.....

.....

Describe the path taken by carbon (iv) oxide released from the tissues of a cockroach into the atmosphere(3mks)

.....

.....

.....

.....

16. Name the blood vessels that transport blood from (3mks)

Small intestines to the liver.....

Heart to the kidney.....

Heart to the lungs.....

The number and distribution of stomata on three different leaves are shown in the table below

Leaf	Number of stomata	
	Upper epidermis	Lower epidermis
A	300	0
B	150	200
C	02	13

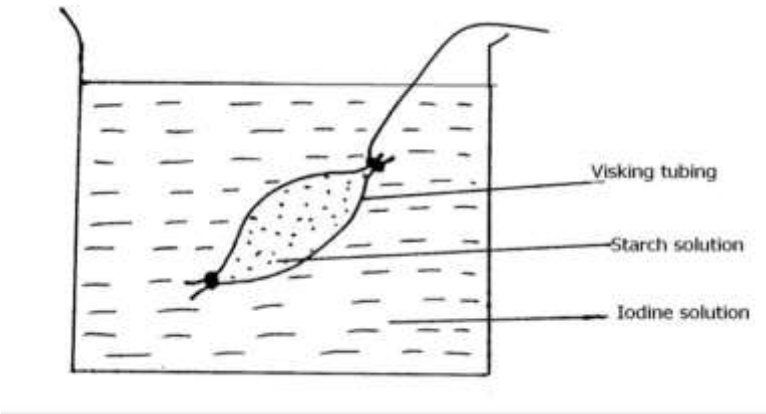
Suggest the possible habitat of the plant from which the leaves were obtained

Leaves	Habitat
A
B

(b) State one modification found in the stomata of leaf C (1mk)

.....
.....

18.



The set-up above was prepared by form one students and left for 1 hour

They made the following observations

	At the start	After one hour
In visking tubing	White solution	Blue-black
In beaker	brown	brown

(a) Identify the physiological process being investigated (1mk)

.....

(b) Explain the observation made (3mks)

.....

.....

.....

In a field study a student came across a plant whose leaves quickly folded when touched, he gave the name as Mimosa Pudica

(a) Identify the mistake he made when writing the scientific name (2mks)

.....

(b) Name the type of response (1mk)

.....

(c) State the possible advantage of this response to the plant. (1mk)

.....

20.State three characteristics features of an efficient respiratory surface (3mks)

.....

.....

.....

.....

21. State three environmental factors that affect the rate of stomatal transpiration (3mks)

.....

.....

.....

22. (a) What is the importance of Adenosine triphosphate (ATP) in mammals (1mk)

.....

(b) State two functions of respiratory Quotient (RQ) (2mks)

.....

.....

.....

23. Give two functions of the exoskeleton in insects (2mks)

.....

.....

24. State four ways of breaking seed dormancy (4mks)

.....

.....

.....

.....

.....

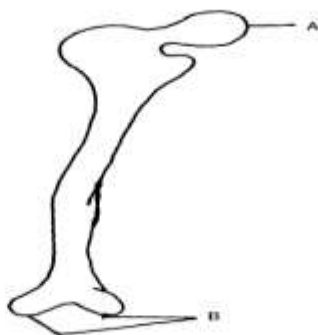
25. Other than sexual intercourse name the other ways by which HIV/AIDS is spread (3mks)

.....

.....

.....

27. The diagram below represents a bone in a mammal



(a) Identify the bone (1mk)

.....

(b) Name the bone that articulate with the above bone at part A (1mk)

.....

(c) Name the joint formed at the part labeled B (3mks)

.....

.....

.....

An animal has the following dental formula,

$1=0/2$ $C=0/2$ $pm\ 3/3$ $m=2/3$

(a) Suggest the type of diet for this animal (1mk)

.....

(b) Give a reason for your answer in (a) above (1mk)

.....

(c) How many teeth does the animal have in total (1mk)

.....

PROJECTION NO. 40

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

231/1

BIOLOGY

PAPER I

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1–30	80	

This paper consists of 8 printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

Answer all the questions in the spaces provided

1. State two features common in mammals and birds (2 marks)

.....

.....

.....

.....

2. Name the causal organism of the following diseases in humans; (2 marks)
- Bilharzia

.....

.....

Syphilis

.....

.....

3. i) Identify the organelle shown below (1 mark)



.....

.....

- ii) How is the organelle you have identified in a(1) above suited to its function (2 marks)

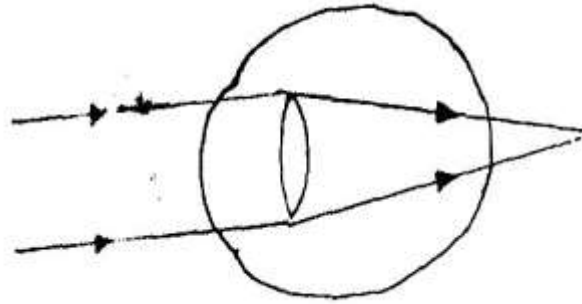
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4 Use the diagram below to answer the questions that follow



i) Name the eye defect represented above (1 mark)

.....

.....

ii) What is the cause of this defect (1 mark)

.....

.....

iii) How can the defect you have named (a) (i) be corrected? (1 mark)

.....

.....

.....

5. Name the components of the blood that do not enter the renal tubule in mammals. (2 marks)

.....

.....

.....

6. Give two factors affecting the rate of respiration. (2 marks)

.....

.....

.....

7.State three structural differences between muscles alimentary canal and biceps muscles.

(3 marks)

.....

.....

.....

.....

.....

.....

.....

a)Name the micro-organism found in the root nodules of legumes (1 mark)

.....

.....

.....

b) State the association of the micro-organisms named in (a) above (1 mark)

.....

.....

.....

c) What is the role of the micro-organism you named in (a) above. (1 mark)

.....

.....

.....

a) Name the stage in mitosis where chromatids collect together at the two opposite ends

of the spindle fibres.

(1 mark)

.....

b) State two functions of centrioles

(2 marks)

.....

.....

.....

10. a) State two functions of large intestines in man.

(2 marks)

.....

.....

.....

Name the disease caused by lack of each of the following in human diet. (3 marks)

Vitamin D

.....

.....

Iodine

.....

.....

Iron

.....

.....

a) In a blood test, a few drops of anti-B serum were added to two samples of blood. It was

noted that agglutination occurred. What were the possible blood groups of the two blood samples? (2 marks)

.....

.....

.....

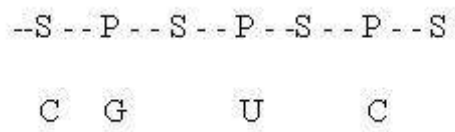
b) Why would carboxyhaemoglobin lead to death? (2 marks)

.....

.....

.....

The figure below is a structural diagram of a portion from a nucleic acid strand.



Giving a reason, name the nucleic acid to which the portion belongs. (2 marks)

Name

.....

.....

Reason

.....

.....

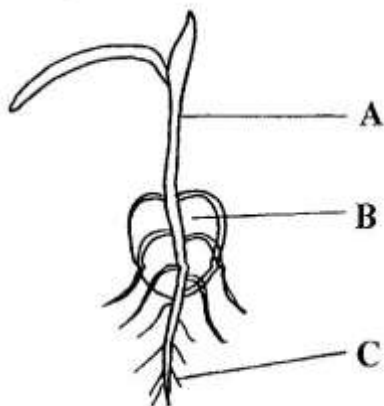
.....

b) Write down the sequence of bases of a complimentary strand to that (1 mark)

.....

.....

The diagram below represents a maize seedling.



Name the structure labeled A and C (2mks)

A

.....

.....

b) i) State the functions of parts labeled B and C (2 marks)

B

.....

.....

C

.....

.....

ii) Name the type of germination exhibited by maize. (1 mark)

.....

.....

14. What is meant by the following terms? (2 marks)

Carbon (IV) oxide fixation

.....

.....

.....

Compensation point

.....

.....

.....

a)State two ways in which floating leaves of aquatic plants are adapted to gaseous exchange(2 marks)

.....

.....

.....

b) Name two structures for gaseous exchange in aquatic plant. (2 marks)

.....

.....

.....

Outline three roles of active transport in the human body.

.....

.....

.....

.....

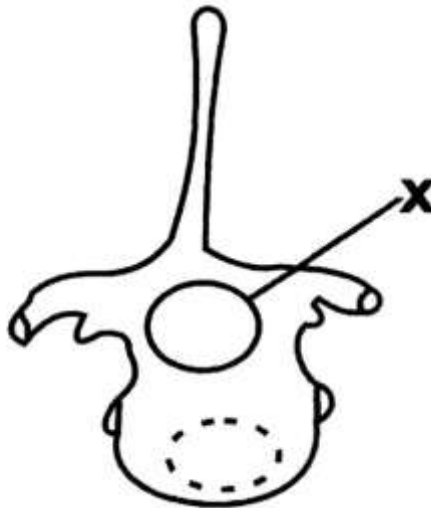
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.....

The diagram below shows a bone from a mammal.



- a) Name the structure that passes through part labeled X. (1 mark)

.....

.....

- b) What function does the vertebra provide for structure X (1 mark)

.....

.....

In which region of the vertebral column is:

i) The bone found? (1 mark)

.....

.....

ii) Give a reason for your answer in c (i) above. (1 mark)

.....

.....

18. a) Explain how the following parts of a mammalian reproductive system are adapted to their functions. (2 marks)

Testis

.....

.....

.....

Uterus

.....

.....

.....

Explain why removal of the ovary after four months of pregnancy does not terminate pregnancy.

.....

.....

.....

State the role of the following hormones in homeostasis

i) Antidiuratic hormone (vasopressin) (1 mark)

.....

.....

.....

ii) Aldosterone hormone (1 mark)

.....

.....

.....

20. Distinguish between plasmolysis and haemolysis (2 marks)

.....

.....

.....

21 . Give two reasons why pressure of blood is greater in arteries than in the veins of mammals. (2 marks)

.....

.....

.....

a)What is meant by

i) Autecology (1 mark)

.....

.....

.....

ii) Synecology (1 mark)

.....

.....

.....

An organelle was magnified 800 times by an electron microscope. Its diameter was 2 millimetres.

Calculate the actual diameter in micrometres. (2 marks)

24. Give two advantages of natural selection to organisms. (2 marks)

.....

.....

.....

.....

25. a) State two ways in which some fungi are harmful to man (2 marks)

.....

.....

.....

.....

- c) List the main characteristics that are used to sub- divide arthropods into classes (2 marks)

.....

.....

.....

.....

26. Euglena is positively phototactic. Of what biological significance is this characteristics

(1 mark)

.....

.....

27. What is the role of the vascular bundles in plant nutrition? (3 marks)

.....

.....

.....

.....

.....

.....

Study the diagram below which shows part of a mammalian tooth and answer the questions that follow



a) With a reason, identify the tooth (2 marks)

Identity

.....

.....

.....

Reason

.....

.....

.....

b) State one adaptation of the tooth to its function (1 mark)

.....

.....

.....

29. a) What is co-dominance? (1 mark)

.....

.....

.....

Name two disorders in human blood that are caused by gene mutation. (2 marks)

.....

.....

.....

29. Plants relatively have less waste to excrete than animals. Giving two reasons to explain this

Observation. (2 marks)

.....

.....

.....

.....

.....

.....

PROJECTION NO. 41

Name: Index no

School: Candidate's sign

Date:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **name** and **index number** in the spaces provided.

Sign and write **date** of examination in the spaces provided above

Answer **all** the questions in section **A** and **B**

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1- 31	80	

1. State the use of each of the following apparatus in collection of specimens. (2mks)
- a) Bait trap
-
- b) Pooter
-
2. Name the class of animals that exhibit (2mks)
- Open circulatory system.....
- Closed circulatory system.....
3. a) State **two** functions of the centrole. (2mks)
- (i).....
- (ii).....
- b) Which organelles would be abundant in: (2mks)
- (i) Skeletal muscle
-
- (ii) Palisade tissue
-
4. State two roles played by active transport in animals. (2mks)
-
-
5. Distinguish between parasitic and predatory modes of feeding. (2mks)
-
-
6. Explain how sunken stomata lower the rate of transpiration. (2mks)
-

7. (a) Give a reason why blood does not clot in an unwounded blood vessel. (1mk)

.....

.....

Name the condition that prevails when a vein or an artery is blocked by a blood clot? (1mk)

.....

.....

8. Name **two** structures for gaseous exchange in aquatic plants. (2mks)

.....

.....

State the importance of the following features in gaseous exchange.

- (a) Presence of cartilage in trachea. (1mk)

.....

.....

- (b) Large surface area of the lungs. (1mk)

.....

.....

10. Name **three** products of anaerobic respiration in plants. (3mks)

.....

.....

.....

Name **one** waste product that is

- (a) Almost absent in the renal vein but is a normally present in the renal artery. (1mk)

.....

- (b) Transported in the blood and is not removed by the kidneys. (1mk)

.....

State the role of the following bacteria in the nitrogen cycle.

- (a) Nitrosomonas.

.....

- (b) Nitrobacter

.....

- (c) Azotobacter

13. (a) State **one** advantage of cross pollination to plants. (1mk)

.....

- (b) Define the following (2mks)

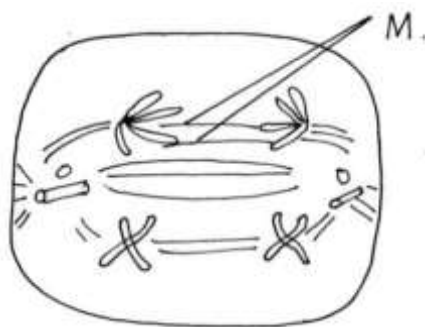
- (i) Hypogynous flower

.....

- (ii) Pistillate flower

.....

The diagram below represents a stage during cell division.



(i) Identify the stage of cell division.
(1mk)

.....

(ii) Give **two** reasons for your answer in **a (i)** above. (1mk)

.....

.....

b) Name the structure labeled **M**. (1mk)

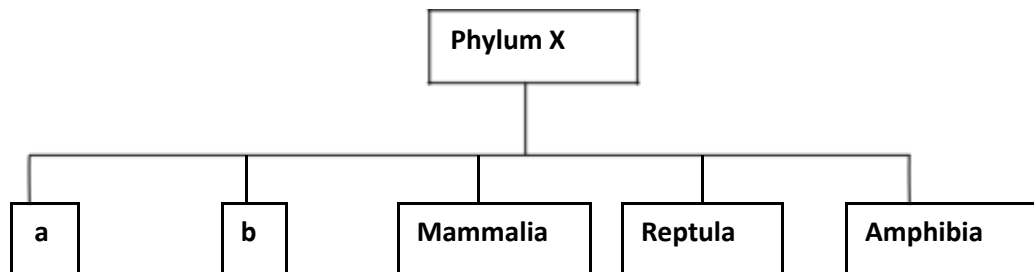
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Explain why several auxiliary buds sprout when a terminal bud in a young tree is removed.
(2mks)

.....

.....

Study the diagram below and answer the questions that follows.



(a) What is the phylum **X** ? (1mk)

.....

.....

(b) Name the classes labeled **a** and **b**. (2mks)

a.....

.....

17 (a) Define the following terms as used in genetics: (2mks)

(i) Mutation

.....
.....

(ii) Mutagen

.....
.....

(b) Write down the base sequence of messenger RNA (mRNA) that would be coded from DNA strand below. (1mk)

C-A-T-G-A-G-T

.....
.....

(a) The wing of a bird and that of an insect are analogous structure. This is an example

Of.....type of evolution. (1mk)

(b) Explain continental drift as an evidence of evolution. (2mks)

.....
.....

State one function of each of the following parts of an eye.

(a) Fovea centralis (1mk)

.....
.....

(b) Aqueous and vitreous humour. (1mk)

.....
.....

Name the type of response exhibited by.

(a) leaves of Mimosa pudica when they fold their after being touched. (1mk)

.....

.....

(b) Euglena when it swims towards the source of light. (1mk)

.....

.....

(c) Sperm cell when it swims towards the ovum. (1mk)

.....

.....

Below is the diagram of a bone. Study it and answer the questions that follow.



(a) Identify the bone. (1mk)

.....

.....

(b) Name the joints that would be formed in the posterior and anterior end of this bone. (2mks)

Posterior end.....

Anterior end.....

(a) Explain why the body temperature of a healthy person may rise upto 39°C on a hot humid day.(2mks)

.....

.....

b) Give **one** function of each of the following hormones. (2mks)

(i) Aldosterone

.....

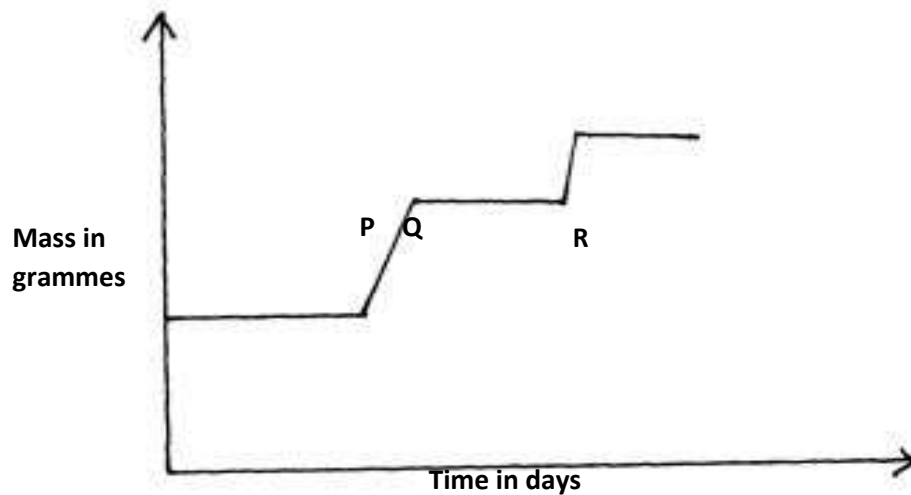
.....

(ii) Antidiuretic Hormone

.....

.....

The graph below shows a sketch of the growth of an insect



(i) Name the type of growth represented by the curve shown above. (1mk)

.....

.....

(ii) Give reasons for the steps of the curve
between **P** and **Q** (1mk)

.....

.....

Q and **R** (1mk)

.....

.....

(a) Name the region of the gut in herbivorous mammals where digestion of cellulose
takes place. (1mk)

.....

.....

(b) A leaf of potted green plant which has been kept in the dark for 24 hrs was smeared with white petroleum jelly on its lower surface and exposed to sunlight for 6hrs. Starch test on the leaf was negative. Account for observation. (3mks)

.....

.....

.....

.....

.....

25. Give the role of the following parts of the male reproductive system. (3mks)

(a) Epididymis

.....

.....

(b) Prostate gland

.....

.....

(c) Urethra.

.....

.....

Name a method that could be used to estimate the population size of the following organisms

(a) Fish in a pond. (1mk)

.....

.....

(b) Kikuyu grass in a garden (1mks)

.....

.....

27. Give necessity of support in plants. (3mks)

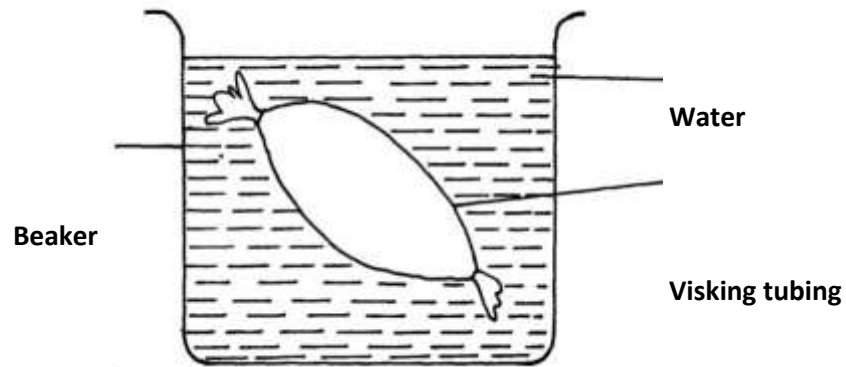
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.....

Study the apparatus that was used by the teacher to demonstrate the human intestine.



a) Name the structure in the intestine which is represented by visking tubing. (1mk)

.....

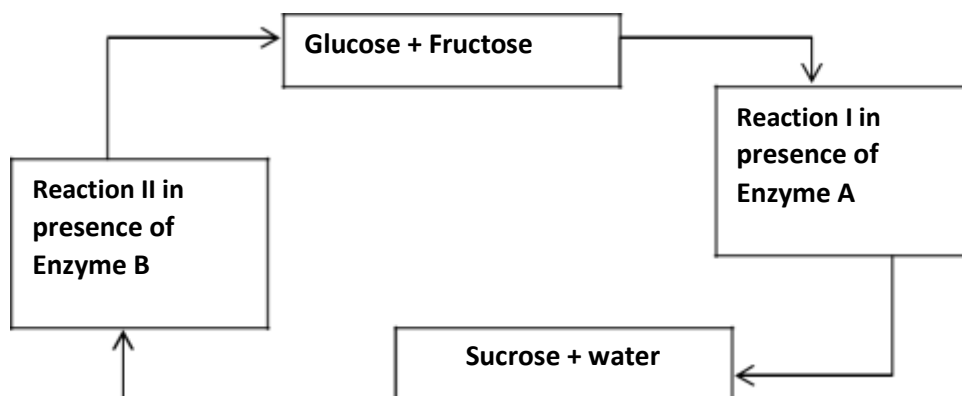
.....

b) Name the part of the intestine to which the water is absorbed into. (1mk)

.....

.....

Study the diagram below



Name the reaction **I** and enzyme **B**

(2mks)

Reaction **I**

Enzyme **B**

30 Give **two** effects of drug abuse on human health.

(2mks)

.....
.....

31. Distinguish between a reflex arc and reflex action.

(2mks)

.....
.....
.....
.....

PROJECTION NO. 42

Name: Index no

School: Candidate's sign

Date:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

*Write your **name** and **index number** in the spaces provided.*

*Sign and write **date** of examination in the spaces provided above*

*Answer **all** the questions in section **A** and **B***

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1- 29	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

1. State the branch of Biology that would be used in solving the problem of disputed parentage. (1mk)

.....

.....

2. Why would carboxyhaemoglobin lead to death? (2mks)

.....

.....

.....

3. State the functions of each of the following parts of male reproductive system. (3mks) (a)
Sertoli Cells.

.....

.....

(b) Epididymis

.....

.....

(c) Seminiferous tubules.

.....

.....

4. The Biological name of housefly is MUSCA DOMESTICA.

(i) State **two** mistakes in the way the biological (scientific) name is written. (2mks)

.....

.....

(ii) Write the name in the correct manner following the rules of binomial nomenclature. (1mk)

.....

.....

5. What is the role of the xylem tissue in plant nutrition (1mk)

.....

.....

6. Identify the type of muscles found in:

a) Sweat duct (1mk)

.....

.....

b)Heart (1mk)

.....

.....

A certain species of flowering plant relies entirely on sexual reproduction for propagation.

The chromosome number of the cell in the ovarian wall is 16.

a) the pollen tube nucleus. (1mk)

.....

.....

b) A cell of the endosperm. (1mk)

.....

.....

8. a) What are fossils? (1mk)

.....

.....

.....

b) State **two** limitations of the use of fossils as an evidence of evolution. (2mks)

.....

.....

.....

.....

9. When are the following hormones secreted?

(a) Insulin hormone.

(1mk)

.....

.....

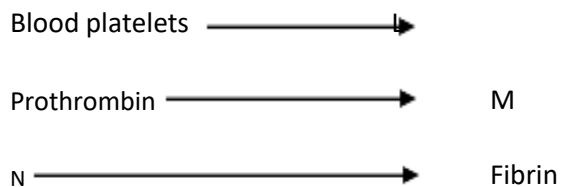
(b) Anti –diuretic hormone (ADH)

(2mks)

.....

.....

10. The schematic diagram below shows main stages in blood clotting.



(a) (i) Identify each of the substances **L** and **N**

(2mks)

L.....

N.....

(ii) Name the enzyme involved in the formation of substance **M**. (1mk)

.....

.

(b) (i) State **one** difference between **N** and fibrin.

(1mk)

.....

.....

Which substance in blood prevents the ordinary conversion of N to fibrin within blood. (1mk)

.....

11. State **two** functions of large intestines in man.

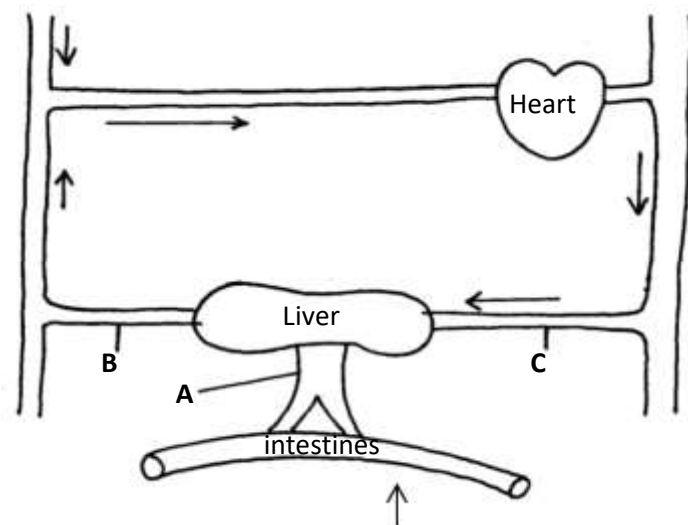
(2mks)

.....

.....

.....

The diagram below represents part of the mammalian blood circulatory system and some associated glands.



(a) Name the blood vessels **A** and **B**.

(2mks)

.....

.....

.....

(b) State **two** structural differences between the blood vessels labeled **A** and **C**

(2mks)

.....

.....

.....

.....

13. State **two** methods of preventing malaria. (2mks)

.....

.....

14. a) Name **two** photo chemical cells in the human retina. (2mks)

.....

.....

b) Name **one** chemical substances and **two** mineral ions involved in impulse transmission in mammals. (2mks)

.....

.....

15. During oxidation of certain food substances the respiratory quotient was found to be 0.718.

(i) Name the type of food substance being oxidized. (2mks)

.....

.....

(ii) State **two** advantages of using the food substances named. (2mks)

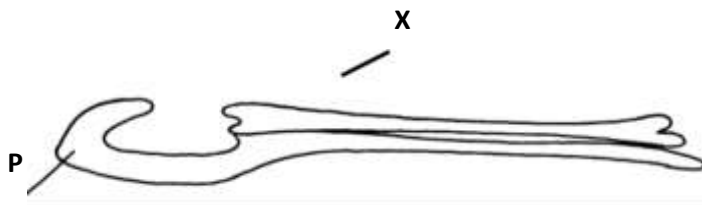
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.....

The diagram below represents a bone obtained from a mammal.



i) Name bone labeled **X** (1mk)

.....

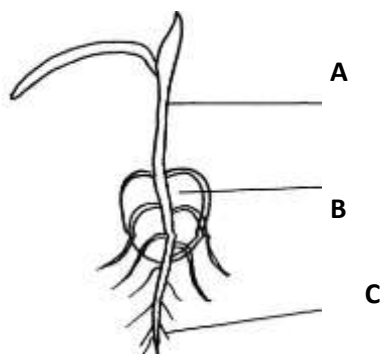
ii) Name structure **P**. (1mk)

.....

iii) Which bones articulate with the bone shown at the notch. (1mk)

.....

17. The diagram below represents a maize seedling.



a) Name the structure labeled **A** and **C** (2mks)

A.....

C.....

b) (i) State the functions of parts labeled **B** and **C** (2mks)

B.....

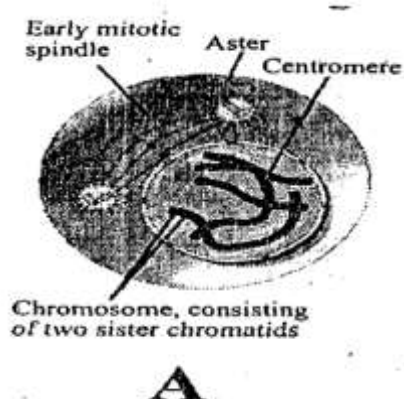
C.....

(ii) Name the type of germination exhibited by maize. (1mk)

.....

.....

18. Below are different cell divisions stages. Study the diagram and answer the questions that follow.



a) Name the stages labelled **A** and **B**. (2mks)

A.....

B.....

b) Give major changes that occur in the cell in the stage **B** (1mk)

.....

.....

19. Explain any **three** adaptations of root hair cells to their functions. (3mks)

.....

.....

.....

.....

20. Give **three** reasons as to why biological control is preferred to chemical control in the control of pests. (3mks)

.....

.....

.....

.....

21. State the type of solution that makes the plant cell. (2mks)

i) Flaccid

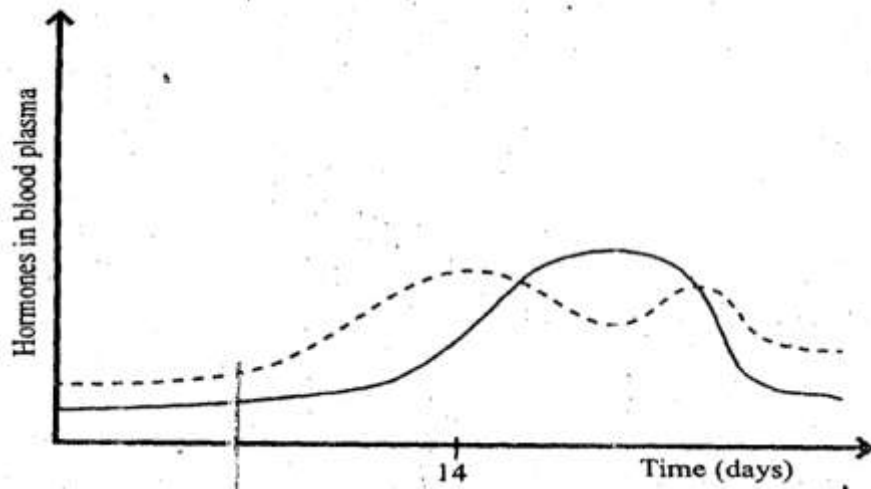
.....

ii) Turgid

.....

22. The graph below shows relative levels of oestrogens and progesterone during the human menstrual

cycle.



a) Mark on the graph the curves that represents (2mks)

i) Progesterone

.....

ii) Oestrogen

.....

b) Which is the most likely day of ovulation from the graph? (1mk)

.....

.....

23. State the roles of gibberellin hormone in growth and development of plants. (3mks)

.....

.....

.....

24. Name the organisms that cause each of the following diseases.

i) Amoebic dysentery. (1mk)

.....

ii) Birlhazia (1mk)

.....

25. Explain how marine fish regulate their osmotic pressure. (3mks)

.....

.....

.....

.....

26. Name the carbohydrate stored in:

i) Cell wall. (1mk)

.....

ii) Mammalian liver. (1mk)

.....

27. a) Give an example of a sex-linked trait on x-chromosome. (1mk)

.....

b) Below is a nucleotide strand

A	A	G	T	C
---	---	---	---	---

(i) Identify the type of nucleic acid strand. (1mk)

.....

(ii) Give a reason for your answer in (b) (i) above. (1mk)

.....

(iii) Write down the complimentary base sequence in the other strand. (1mk)

.....

28. a) Name the body covering found in members of phylum Arthropoda. (1mk)

.....

b) State **three** uses of the structure identified in (a) above for the survival of Arthropodas. (3mks)

.....

.....

.....

29 A rhinoceros in a national park was found to be infected with ticks. State the trophic level occupied by the :

(i) Rhinoceros. (1mk)

.....

(ii) Ticks (1mk)

.....

PROJECTION NO. 43

Name: Index no

School: Candidate's sign

Date:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **name** and **index number** in the spaces provided.

Sign and write **date** of examination in the spaces provided above

Answer **all** the questions in section **A** and **B**

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1- 32	80	

This paper consists of 7 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing.

Answer all questions in this paper in the spaces provided.

Name the part of the flower which develops into;

(a) Seed (1mk)

(b) fruit (1mk)

2. (a) Name **two** tissues in plants which are thickened by lignin. (2mks)

.....
.....

(b) How is support attained in herbaceous plants? (2mks)

.....
.....

3. State the role of vitamin C in humans. (2mks)

.....
.....

4. State the importance of tactic response among some members of kingdom protocista. (1mk)

.....
.....

(a) Name the response to contact with surface exhibited by tendrils and climbing stems in plants.(1mk)

.....
.....

(b) State **three** biological importance of tropisms to plants. (3mks)

.....
.....

6 (a) What is adaptive radiation? (2mks)

.....
.....

(b) Give a reason why organisms become resistant to drugs. (1mk)

.....

.....

7. Name the organelle in which protein synthesis takes place in a cell. (1mk)

.....

.....

8. (a) The type of circulatory system found in members of the class insecta is. (1mk)

.....

.....

(b) Name the blood vessel that transports blood from:

(i) Small intestines to the liver (1mk)

.....

.....

(ii) the lungs to the heart. (1mk)

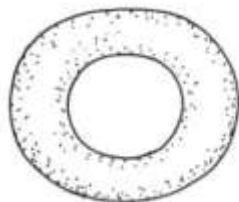
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The diagrams below show a red blood cell that was subjected to a certain experimental treatment.

At start

At the end of experiment



(a) Account for the shape of the cell at the end of the experiment. (2mks)

.....
.....

(b) Draw a diagram to illustrate how a plant cell would appear if subjected to the same experimental treatment. (1mk)

10. (a) What is homeostasis? (1mk)

.....
.....

(b) Name **three** processes in the human body in which homeostasis is involved. (3mks)

.....
.....

11. State **two** functions of smooth endoplasmic reticulum. (2mks)

.....
.....
.....

12. (a) State the mode of asexual reproduction in yeast (1mk)

.....
.....
(b) Distinguish between protandry and protogyny. (2mks)

.....
.....

13. State **two** structural differences between ribonucleic acid (RNA) and deoxyribonucleic acid (DNA) (2mks)

.....
.....

14. (a) Name the bacteria found in the root nodules of leguminous plants. (1mk)

.....
.....

(b) What is the role of the bacteria named in (a) above? (1mk)

.....
.....

15. Name the causative agent of typhoid fever. (1mk)

.....
.....

16. State the function of acetylcholine. (1mk)

.....
.....

17. Why do green plants require the following mineral elements

(a) Nitrogen..... (1mk)

(b) Magnesium..... (1mk)

18. A germinating maize grain was placed in starch agar in a Petri-dish. After 48 hours the agar was flooded with iodine solution. The area around the grain changed to the colour of iodine while the rest turned blue black. Account for this observation (2mks)

.....

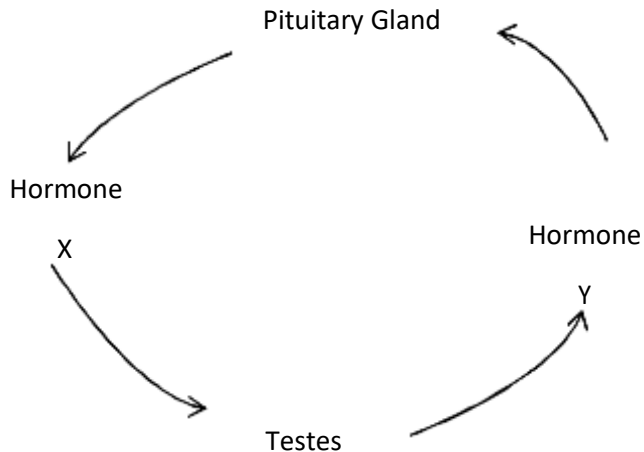
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The diagram below represents a simple endocrine feed-back mechanism in a human male.



(a) Name the hormone labeled X. (1mk)

.....

.....

(b) Stated **two** differences that may be observed between a normal male and one who is capable of producing hormone labeled Y. (2mks)

.....

.....

A person was found to pass out large volumes of dilute urine frequently.

Name the:

(a) disease the person was suffering from. (1mk)

.....

.....

(b) hormone that was deficient. (1mk)

.....

.....

21. Name **one** waste product that is

(a) almost absent in the renal vein but normally present in the renal artery. (1mk)

.....

.....

(b) transported in the blood and not removed by the kidneys. (1mk)

.....

.....

22. Explain how sunken stomata lower the rate of transpiration. (2mks)

.....

.....

Oil can be applied on stagnant water to control the spread of malaria.

(a) How does this practices control the spread of malaria. (1mk)

.....
.....
(b) Give a reason why this practice should be discouraged. (1mk)

.....
.....
The diagram below represents an experiment that was set up to investigate a certain process.

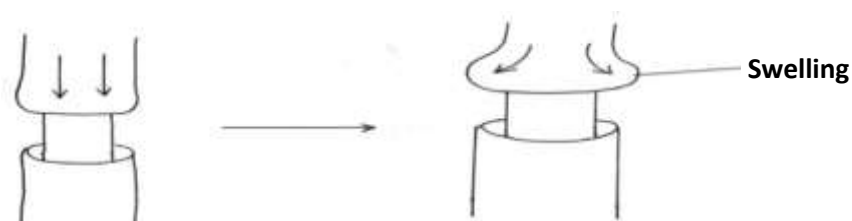


Diagram 1

Diagram 2

(a) Name the process that was being investigated. (1mk)

.....
.....
(b) Account for the swelling in diagram 2. (2mks)

.....
.....
A rhinoceros in a national park was found to be infected with ticks. State the trophic level occupied by the:

(a) rhinoceros

(1mk)

.....

.....

ticks

.....

.....

26 State **three** pieces of evidence that support the theory of evolution.

(3mks)

.....

.....

.....

27. State the functions of the following structures in a mammalian tooth.

(a) pulp cavity

(2mks)

.....

.....

(b) enamel

(1mk)

.....

.....

28. Explain how a grayish black substance develops on a moist bread after few days.

(3mks)

.....

.....

.....

.....

29. What osmoregulatory changes would take place in a marine amoeba if it was transferred to a fresh

water environment?

(3mks)

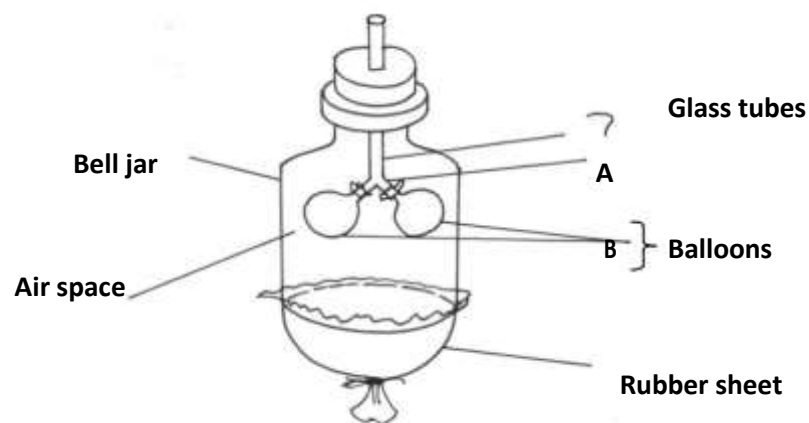
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.....

The diagram below represents a model of lungs and thorax. When rubber sheet is pulled downwards the balloons inflate; and when it is raised the balloons deflate.



(a) To what parts of the mammalian body parts are represented by;

(i) glass tubes A and B

(1mk)

.....

.....

(ii) bell jar

(1mk)

.....

.....

(iii) rubber sheet

(1mk)

.....

.....
(iv) balloons

(1mk)

31. In an experiment it was found that when maggots are exposed to light they move to dark areas.

(a) Name the type of response exhibited by the maggots.

(1mks)

.....
.....

(b) Name the advantages of the response to the maggots.

(2mks)

.....
.....

State **four** ways in which immuno-deficiency virus (HIV) is transmitted other than through sexual intercourse.(4mks)

.....
.....
.....
.....

PROJECTION NO. 44

Name: Index no

School: Candidate's sign

Date:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **name** and **index number** in the spaces provided.

Sign and write **date** of examination in the spaces provided above

Answer **all** the questions in section **A** and **B**

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1-31	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

1. Give the function of the following organelles. (3mks)

(a) Nucleolus

.....

(b) Lysosomes

.....

(c) Ribosomes

.....

2. State the name given to the study of; (2mks)

(a) Microorganisms

.....

(b) Cells

.....

3. State **three** ways by which respiratory surfaces are adapted to their functions. (3mks)

.....

.....

.....

The diagram below represents a transverse section of a plant organ.

INSERT DIAGRAM

(a) Name the organ from which the section was obtained.

(1mk)

.....

(b) (i) Name the class to which the plant belongs. (1mk)

.....

(ii) Give reason for your answer. (1mk)

.....

(c) Name the parts labeled; (2mks)

Y.....

X.....

5. State **three** external differences between crustacean and chilopoda. (3mks)

.....

.....

.....

6. Differentiate between haemolysis and plasmolysis. (2mks)

.....

.....

7. Define the term parthenocarpy. (1mk)

.....

.....

8. Name blood vessels that supply blood to; (2mks)

(i) Heart muscles

.....

(ii) Kidney

.....

9. Distinguish between ecological niche and habitat. (2mks)

.....

.....

10.State **two** ways by which plants excrete their wastes. (2mks)

.....

.....

11.List **three** tissues in plants that bring about mechanical support. (3mks)

.....

.....

.....

2. Name the causal organism of the following diseases in humans; (2mks)

(a) Bilharzia

.....

(b) Syphilis

.....

13.(a) What are sex linked genes. (1mk)

.....

.....

(b) Give **three** examples of sex linked traits in man. (3mks)

.....

.....

.....

Distinguish between analogous and homologous structures.

(2mks)

.....

.....

15. State **two** advantages of polyploidy in plants.

(2mks)

.....

.....

16. Explain why it is not advisable to sleep in a room with burning charcoal stove. (3mks)

.....

.....

.....

17. (i) What do you understand by the following terms.

(2mks)

(a) Apical dominance

.....

.....

(b) Etiolation

.....

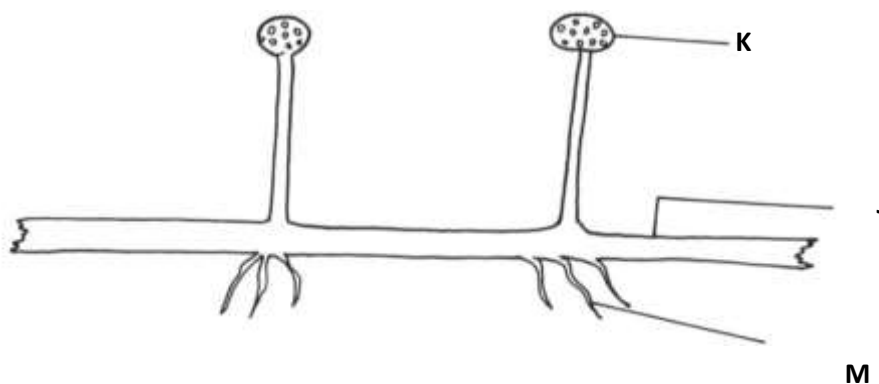
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(ii) Give the importance of 17 (i) (b) above.

(1mk)

18. Give **two** roles of bile salts in digestion in humans. (2mks)

The diagram below illustrates the structure of rhizopus (bread mold)



- (a) Name the parts labeled **J** and **M**. (2mks)

J.....

M.....

- (b) State the function of structure labeled **K**. (1mk)

20. Identify the bones with the following features. (3mks)

- (a) Vertebrarterial canal

(b) Odontoid process

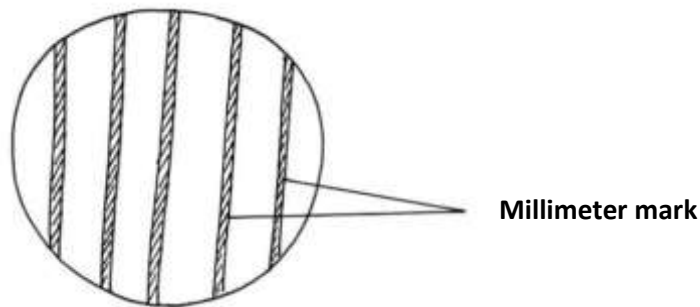
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(c) Long neural spine

.....

(a) A student carried out an experiment on microscope work. The field of view was as shown in the following diagram.

If she counted 20 cells on the diameter of the field of view. What was the approximate size of each cell in micrometers (μm). Show your working. (2mks)



(b) Give reasons why the following should be done while preparing specimen for microscopy.(2mks)

(i) Keeping under water

.....

(ii) Staining

.....

The following is the dental formula of a dog and rabbit.

Dog $I \frac{3}{3} C \frac{1}{1} pm \frac{4}{4} m \frac{2}{3}$

Rabbit $I \frac{2}{1} C \frac{0}{0} pm \frac{3}{2} m \frac{3}{3}$

(a) State **two** differences observed in the jaws and dentition of dog and rabbit. (2mks)

.....

.....
.....
(b) Suggest mode of feeding for the two organisms.

(2mks)

Dog

.....
Rabbit
.....

23. State the changes that occur in blood vessels in human skin during thermoregulation. (2mks)

.....
.....
24. Give the importance of internal fertilization in human.

(1mk)

.....
.....
25. Differentiate between Lamarck's theory and Darwin's theory.

(1mk)

.....
.....
The illustration below represents a neurone in human body.



(a) Identify the neurone

(1mk)

.....
(b) Give the function of the neurone. (1mk)

.....
(c) Identify the region in body where its located. (1mk)

.....
27. (a) The shoots of green plants grow towards source of light. Name the response. (1mk)

.....
(b) Name the hormone responsible for the response. (1mk)

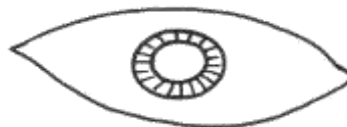
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28. Outline three applications of anaerobic respiration. (3mks)

.....
29. (a) Name the organ that produce urea that is found in blood stream. (1mk)

.....
(b) Explain why amoeba does not burst when placed in distilled water. (2mks)

.....
.....
.....
The illustration below shows the appearance of pupil of eye in normal light.

(a) Make an illustration to show how the size of pupil will appear in bright light. (2mks)



(b) Give **two** functions of human ear.

(2mks)

.....

.....

State **two** factors that contribute to the exponential phase in the population growth curve.

(1mk)

.....

.....

PROJECTION NO. 45

Name: Index no

School: Candidate's sign

Date:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **name** and **index number** and **school** in the spaces provided above.

Sign and write **date** of the examination in the spaces provided above

Answer **all** the questions in section **A** and **B**

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-29	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

State the functions of each of the following structures in a cell.

Golgi apparatus

(2mks)

.....

.....

.....

Cell sap

(2mks)

.....

.....

.....

2. Give **two** distinguishing characteristics of cervical vertebrae.

(2mks)

.....

.....

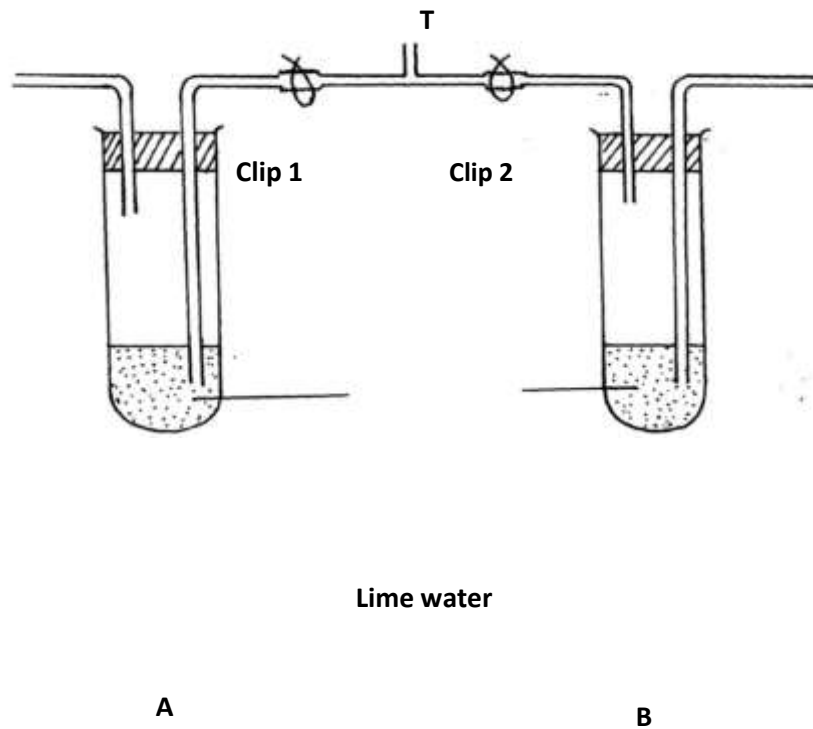
(a) Name the carbon compound responsible for raising of the dough during baking of bread.
(1mk)

.....

.....

.....

The diagram below represents an experiment set-up to determine a certain physiological aspect of man. Air was breathed in and out several times at tube labelled **T**.



(i) What was the aim of the experiment? (1mk)

.....

.....

.....

(ii) State the observations made on lime water in tubes **A** and **B**. (2mks)

.....

.....

.....

A child of blood group O is born to a woman of blood group A and a man of blood group B. What are the genotypes of the parents? (2mks)

Mother

.....

.....

.....

Father

.....

.....

.....

5. Name **three** parts of the nephron found in the cortex. (3mks)

.....

.....

.....

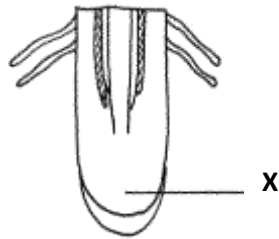
6. State **two** symptoms of diabetes mellitus. (2mks)

.....

.....

.....

The diagram below represents a longitudinal section of a plant.



State **three** characteristics of cells found at the part labelled **X**. (3mks)

.....

.....

.....

8. Name **three** classes of phylum chordate characterized by presence of scales. (1mk)

.....

.....

.....

9. What is natural selection? (2mks)

.....

.....

.....

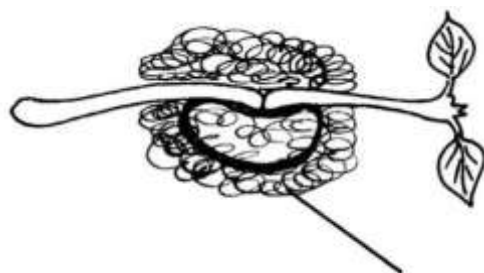
Name the structure on the bodies of arthropods responsible for the intermittent growth curve pattern.(1mk)

.....

.....

.....

The diagram below represents a seedling growing horizontally in a moist cotton wool.



Moist cotton wool

Account for the results that would be observed on the radicle after 5 days of growth. (3mks)

.....

.....

.....

Give a reason for each of the following on a mammalian Red blood cell.

(a) Absence of the nucleus (1mk)

.....

.....

.....

(b) Biconcave shape (1mk)

.....

.....

.....

13. How is the pulp cavity adapted to its functions? (2mks)

.....

.....

.....

14. (a) Name the tissue in higher plants responsible for transport of manufactured foods. (1mk)

.....

.....

.....

(b) Give **two** importance of transpiration in plants. (2mks)

.....

.....

.....

Distinguish between;

(a) Biomass and carrying capacity. (2mks)

.....

.....

.....

(b) Interspecific and intraspecific competitions. (2mks)

.....

.....

.....

.

16. Name **two** bacterial diseases controlled by boiling drinking water. (2mks)

.....

.....

.....

17. State the function of nectarines in an insect pollinated flower. (2mks)

.....

.....

.....

18. State **two** factors in a seed that causes seed dormancy. (2mks)

.....

.....

.....

The equation below summarizes a reaction that occurs in a plant organ.



- (a) Name the pigment A and product X. (2mks)

Pigment A

.....

.....

.....

Product X

.....

.....

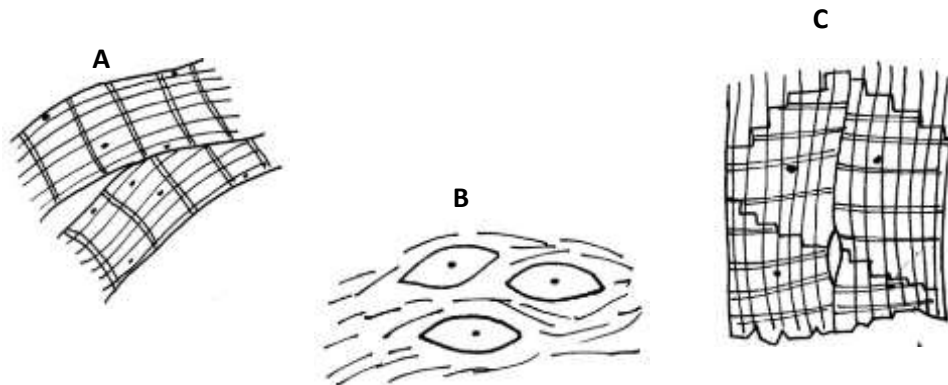
.....

(b) Name the organelle in plants where the above reaction occurs. (1mk)

.....

.....

The diagrams below represent three types of muscles found on a mammalian body.



Name the location of each of the three types of muscles on the body. (3mks)

A.....

B.....

C.....

21. Give a reason why herbaceous plants remain upright. (2mks)

.....

.....

.....

22. (a) State the significance of emulsification of fats in the bodies of human beings. (2mks)

.....

.....

.....

(b) Name the structure in the body of a mammal that stores bile. (1mk)

.....

.....

.....

23. State **two** functions of a pollen tube. (2mks)

.....

.....

.....

The table below shows relative rates of transpiration in three different trees growing under similar conditions.

Tree	Relative rate of transpiration
A	195
B	20
C	70

(a) State the most likely habitat for plant **B**. (1mk)

.....

.....

.....

(b) State the structural adaptations of the stomata on the leaves of plant **B**. (2mks)

.....

.....

.....

25. Name **two** hormones responsible for regulation of blood sugar. (2mks)

.....

.....

.....

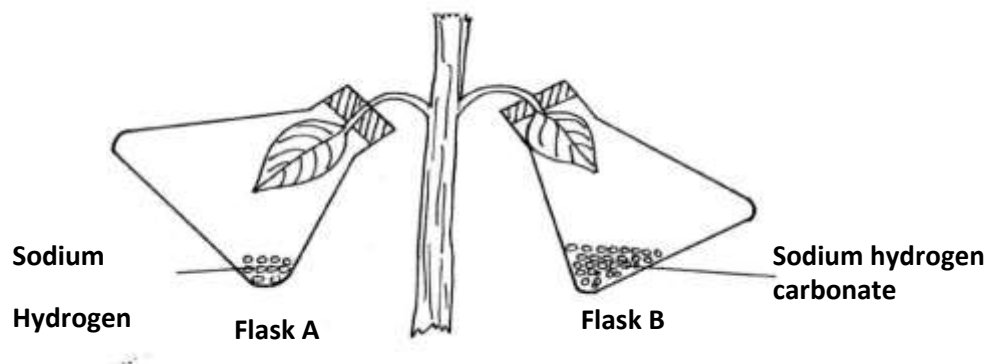
26. Account for the decrease in dry weight of endosperm of a cereal during germination. (2mks)

.....

.....

.....

A healthy plant was kept in dark for 24 hours. Two of its leaves were enclosed in glass jars as shown in the diagram below. The plants were then exposed to light for shows.



- (i) Leaves in flask A and B were tested for a food substance. Name the food substance tested for in each of the flasks. (1mk)

.....

.....

.....

(ii) What were the results of the test started in (i) above. (2mks)

Flask A.....

Flask B.....

28.Name **two** main support tissues in woody plants. (2mks)

.....
.....
.....

29.(a) State **two** functions of a synovial fluid at a movable joint. (2mks)

.....
.....
.....

(b) Name the structure at a movable joint responsible for secretion of synovial fluid. (1mk)

.....
.....
.....

30.State **two** advantages of hybrid vigour. (2mks)

.....
.....
.....

31. How is ascaris lumbricoides adapted to its parasitic mode of life? (2mks)

.....
.....
.....

32. (a) At what stage of meiosis does crossing over take place. (1mk)

.....

.....

.....

(b) What is the importance of crossing-over? (1mk)

.....

.....

.....

33.Explain the functions of the ear drum. (2mks)

.....

.....

.....

PROJECTION NO. 46

Name: Index no

School: Candidate's sign

Date:

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **name** and **index number** in the spaces provided.

Sign and write **date** of examination in the spaces provided above

Answer **all** the questions in section **A** and **B**

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1- 30	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

1.a) What is cross pollination? (1mk)

.....

b) Name the spore producing structure of

(i) Moss plant. (1mk)

.....

(ii) Fern plant. (1mk)

.....

2. Name the material which forms.

(i) Hard exoskeleton of arthropods. (1mk)

.....

(ii) Thick walls of the Xylem vessels. (1mk)

.....

3 (a) Distinguish between transpiration and guttation. (2mks)

.....

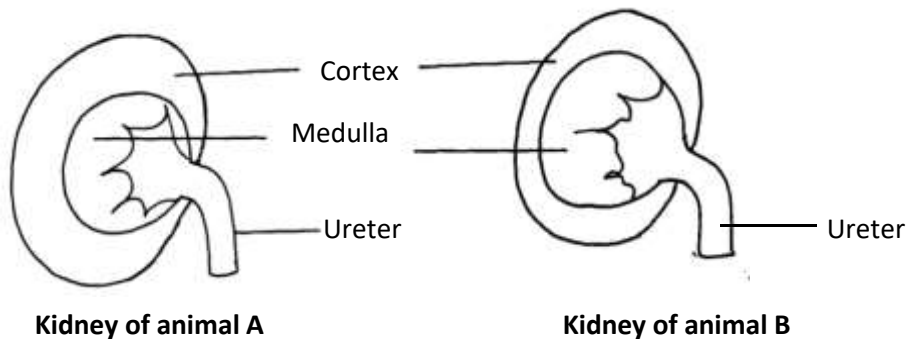
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(b) What causes 'biological' wilting in plants. (1mk)

.....

.....

The diagrams below represent kidney of two different animals living in different ecological habitats. Study them and answer the questions which follow.



(i) Which kidney represents an animal living in a fresh water habitat? (1mk)

.....
(ii) Give a reason for your answer in (i) above. (2mks)

.....
5 (a) What are vestigial structures? (1mk)

.....
(b) State **one** major importance of divergent evolution to living organisms. (1mk)

.....
6. Explain how high temperatures above optimum would affect the rate of enzyme activity. (2mks)

.....
7. Give **two** functions of a cell membrane. (2mks)

.....
8(a) Explain the term cell specialization. (1mk)

.....
(b) State how each of the cells listed is below specialized to carry out its function;

(i) Palisade cell. (1mk)

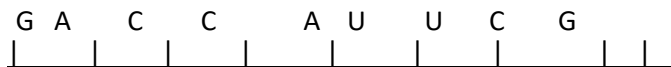
.....
(ii) A sperm cell. (1mk)

.....

9. State **two** roles of green plants in a fish aquarium other than providing food for the fish. (2mks)

.....
.....

10.(a) The diagram below represents a section or portion of a certain nucleic acid.



With a reason, identify the type of nucleic acid whose portion is shown above. (2mks)

Nucleic acid:.....

Reason.....

b) A certain type of gene mutation changed the word BRUSH TO BUS. Identify the type of gene mutation described above. (1mk)

.....

11. Name the disease of the blood characterized by

(i) Abnormally large number of white blood cells. (1mk)

.....
...

(ii) Crescent-shaped haemoglobin instead of the normal biconcave shape. (1mk)

.....

12. Give a reason for each of the following biological phenomena:

(i) A mature plant cell does not lose its shape even after losing water maximally. (2mks)

.....
.....

Amoeba does not bust when placed in a solution which is hypotonic to its cytoplasmic contents. (2mks)

.....

.....

13 (a) Name **two** metallic ions which are involved in nerve impulse transmission. (2mks)

.....

.....

(b) State the function of each of the following structures in a mammalian ear. (2mks)

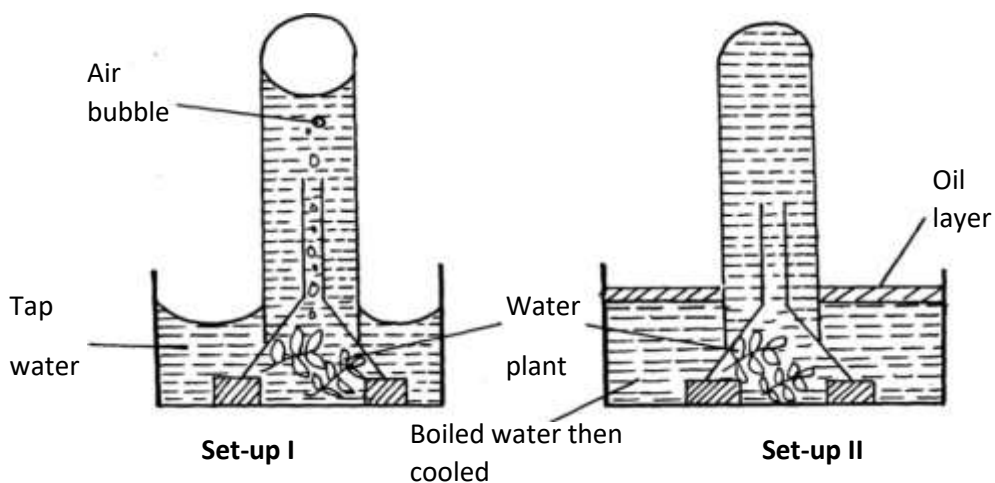
(i) Tympanic membrane.

.....

(ii) Eustachian tube

.....

14. Below are two set-ups of apparatus used by a group of students to investigate a certain physiological process. The apparatus were put in bright light for three hours, some air bubbles were observed to evolve in set-up I but not in set-up II



a) Explain why air bubbles were forming in set-up I (2mks)

.....

.....

b) Account for the observation obtained in set-up II of the experiment. (2mks)

.....

.....

15. Differentiate between primary and secondary growth in flowering plants. (2mks)

.....

.....

b)What is the importance of secondary growth? (1mk)

.....

16. State **two** functions of the tongue during digestion in the mouth of man. (2mks)

.....

.....

17. Damage to the mammalian liver may lead to indigestion of fats. Explain this observation. (3mks)

.....

.....

.....

18. (a) What is tropism? (1mk)

.....

(b) Identify each of the types of the tropisms described below:-

(i) pollen tube growing towards the ovules. (1mk)

.....

(ii) A bean seedling put horizontally on a wet cotton wool has its shoot curving upwards while its roots curve downwards. (1mk)

.....

The table below shows the concentration of some ions in a pond water in the cell sap of an aquatic plant growing in a pond.

Ions	Concentration in pond water (ppm)	Concentration in the cell sap (ppm)
Sodium	500	30
Potassium	200	2000
Magnesium	15	10
Chloride	180	200

a) Name the process by which the following ions could have been taken up by these plants.

(i) Potassium ions.

(1mk)

.....

.....

(ii) Sodium ions.

(1mk)

.....

.....

b) Explain the role of oxygen in sodium –potassium pump mechanism across the membrane of a neuron.

(2mks)

.....

.....

20 a) State the role of septum in the mammalian heart.

(1mk)

.....

.....

(b) Give **two** advantages that a double circulation has over a single circulation.

(2mks)

.....

.....

How does each of the following contribute to cooling of the body of a mammal:

Sweating.(2mks)

.....

.....

(b) Vasodilation

(2mks)

.....

.....

22. Name the carbohydrate that is

a) Found in abundance in the mammalian blood.

(1mk)

.....

b) Stored in the mammalian liver.

(1mk)

.....

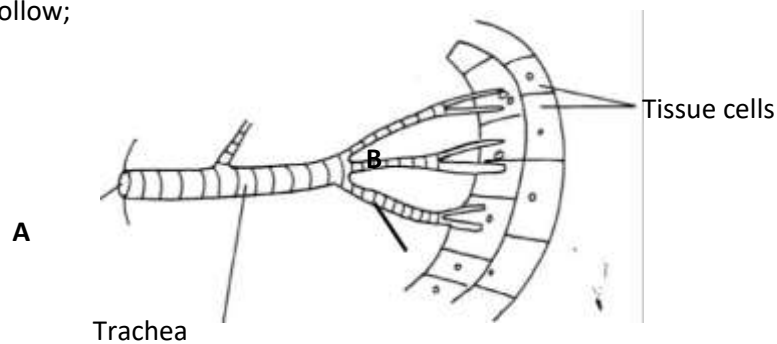
c) Stored in plants' seeds.

(1mk)

.....

The diagram below shows part of the tracheal system of a cockroach. Study it and use it to answer the

questions that follow;



a) Name the parts labelled **A** and **B**.

(2mks)

.....

B.....

b) (i) State the role played by the liquid found at the end of the structure labelled **B** (1mk)

.....

.....

(ii) State the biological importance of rings found on the wall of the trachea.

(1mk)

.....

.....

24.(a) State **two** advantages of the foetus being surrounded by amniotic fluid during its development. (2mks)

.....

.....

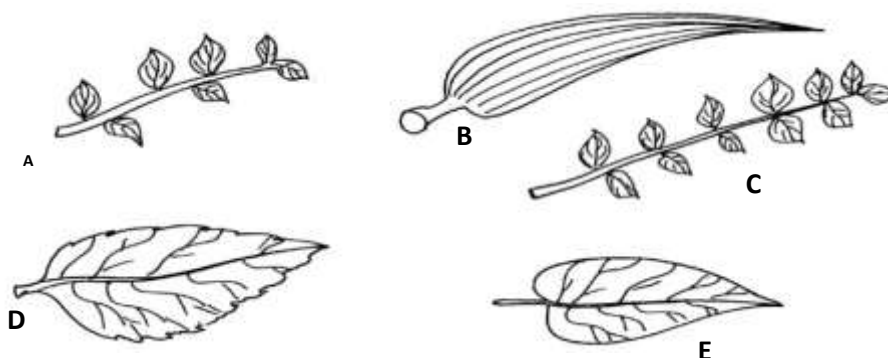
(b) Distinguish between dioecious and monoecious plants.

(2mks)

.....

.....

25 (a) The diagrams below represents leaves obtained from different plants species.



Using the following characteristics construct a dichotomous key to identify the leaves. (3mks)

Leaf venation

Arrangement of leaflets

Leaf type

Leaf margin

You must begin the step I with leaf type as shown below:

1 (a) simple leaf.....go to 2

(b) compound leaf.....go to 4

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

b) Name the class of phylum arthropoda whose members have two body parts and two pairs of legs per segment. (1mk)

.....

During an ecological study. Students collected the following organisms.

Nile perch

Mosquito larvae

Algae

Tilapia

a) Draw a possible food chain that exists among these organisms

(1mk)

b) Identify the trophic level occupied by the following organisms.

i) Nile perch.

(1mk)

.....

ii) Algae.

(1mk)

.....

27. Explain how sunken stomata assist in reducing the rate of transpiration.

(2mks)

.....

.....

.....

.....

State **two** features of nerves which increase the speed of nerve impulse transmission along them.
(2mks)

.....

.....

29 (a) Define the term Ecdysis.

(1mk)

.....

.....

(b) What is the importance of Ecdysis in Arthropods.

(1mk)

.....

.....

30 A student viewed and drew a plant cell of a diameter 4mm using a light microscope whose eyepiece lens was marked X1 and objective lens marked X5. How many cells were linearly arranged along the microscope's field of view whose diameter was 8mm. (show your work.) (4mks)

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PROJECTION NO. 47

Name

Index No.....

School

Candidate's Signature

Date

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the space provided.

Answer **ALL** questions in the spaces provide.

FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE SCORE
1–28	80	

This paper consists of 9 printed pages.

Candidates should check to ensure that all pages are printed as indicated and no questions are missing

State three characteristics of members of monera that are not found in other kingdoms. (3Marks)

.....

.....

.....

2. Name the tissue in plants responsible for

a) Transport of water and mineral salts. (1Mark)

.....

b) Transport carbohydrates. (1Mark)

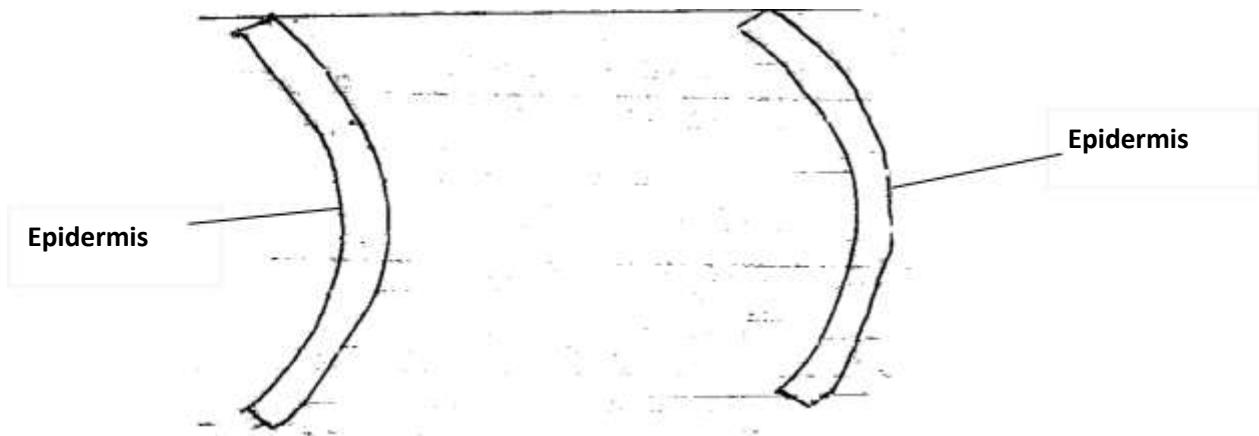
.....

c) Primary growth. (1Mark)

.....

.....

A freshly obtained dandelion stem measuring 5cm long was split lengthwise to obtain two similar pieces. The pieces were placed in solutions of different concentrations in Petri dishes for 20minutes. The appearance after 20 minutes is as shown.



State the significance of the biological process involved in the experiment. (2Marks)

.....

.....

.....

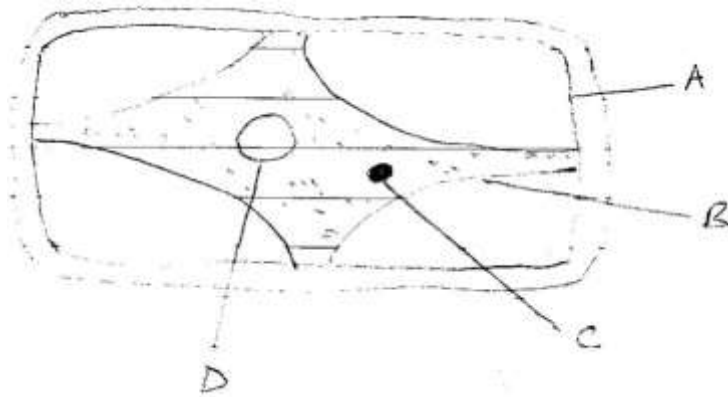
4. What is an allele?

(1Mark)

.....

.....

5. The diagram below shows a plant cell placed in a certain treatment.



a) In which treatment was it placed into?

(1Mark)

.....

b) Name the parts.

A -

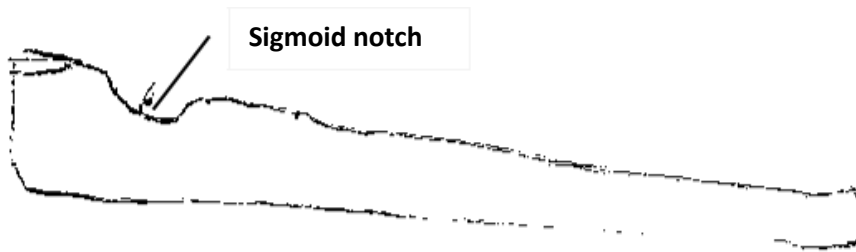
B -

C -

D -

(5Marks)

A bone obtained from a mammal is represented by the diagram below.



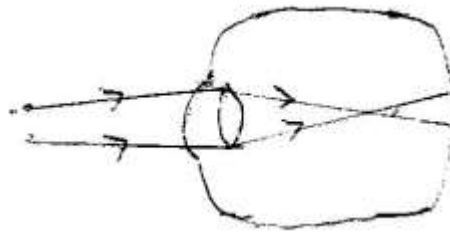
a) Name the bone (1Mark)

.....

b) Which bone articulate with the bone shown in the diagram at the sigmoid notch. (1Mark)

.....

7. The diagram below shows the position of an image formed in a defective eye.



a) i) Name the defect. (1Mark)

.....

ii) Name the cause of the defect. (1Mark)

.....

b) Explain how the defect named above can be corrected? (2Marks)

.....

.....

.....

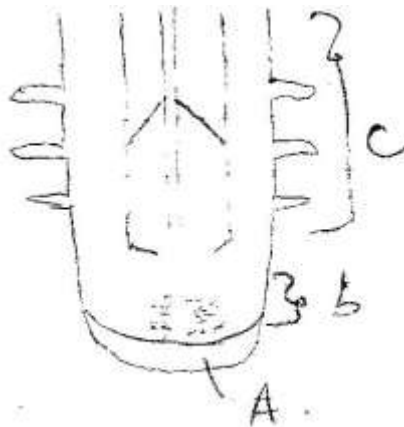
8. In an accident a victim suffered brain injury. Consequently he had lost memory. Which part of brain was damaged? (1Mark)

.....
 .

9. Distinguish between homologous and analogous structures. (2Marks)

.....

10. The diagram below shows regions of a root tip.



a) What is the function of the part labeled A? (1Mark)

.....

b) State the regions labeled b and C.

b

c..... (2Marks)

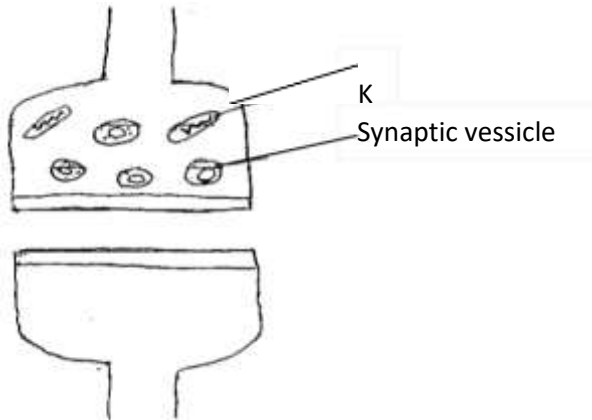
11. Name the structures used in locomotion in each of the following organisms. (3Marks)

a) Euglena.

Paramecium.

Amoeba.....

Study the diagram below representing a neuro junction of a mammal.



a) On the diagram, indicate the direction of impulse transmission using an arrow. (1Mark)

b) State the name of the chemical that is contained in the synaptic vesicle. (1Mark)

.....

c) State the functions of the part labeled K. (1Mark)

.....

.....

13. State the causative agent for the following diseases: -

a) Syphilis (1Mark)

.....

b) Malaria (1Mark)

.....

14. What are the functions of the Golgi apparatus?

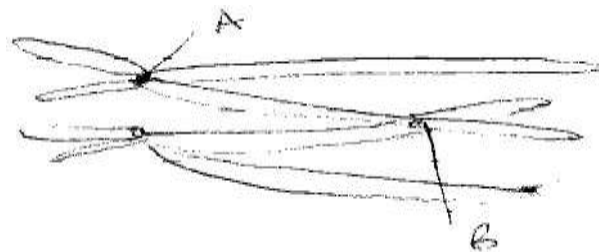
(3Marks)

.....

.....

.....

15. A phenomena which occurs during cell division is shown in the diagram.



a) Name the parts labeled A and B

(2Marks)

A.....

B.....

b) Which stage of cell division does the process occur?

(1Mark)

.....

Give a reason why primary productivity in an aquatic ecosystem decreases with depth. (2Marks)

.....
.....
.....

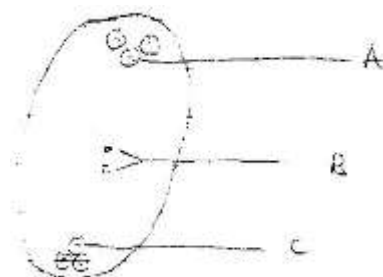
Give two classes of the phylum chordata whose all members are poikilothermic.

(2Marks)

.....
.....

18. The illustration below shows part of the ovary of an angiosperm.

(3Marks)



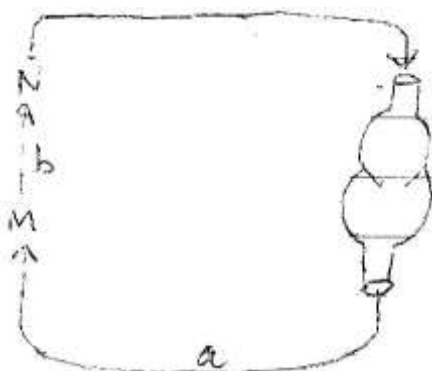
State the names of the parts labeled A, B and C.

A.....

B.....

C.....

19. Observe the diagram of the circulatory system below and answer the questions that follow.



a) Name the type of circulation shown in the diagram.

(1Mark)

.....

b) Identify the parts labeled M and N.

(2Marks)

M.....

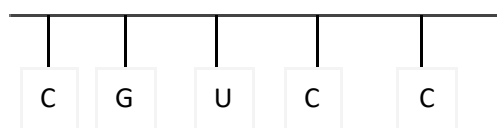
N.....

c) Identify which part carries oxygenated blood.

(1Mark)

.....

20. The diagram below represents a portion of a nucleic acid.



With a reason, identify the nucleic acid to which the portion belongs.

(2Marks)

Type of the nucleic acid

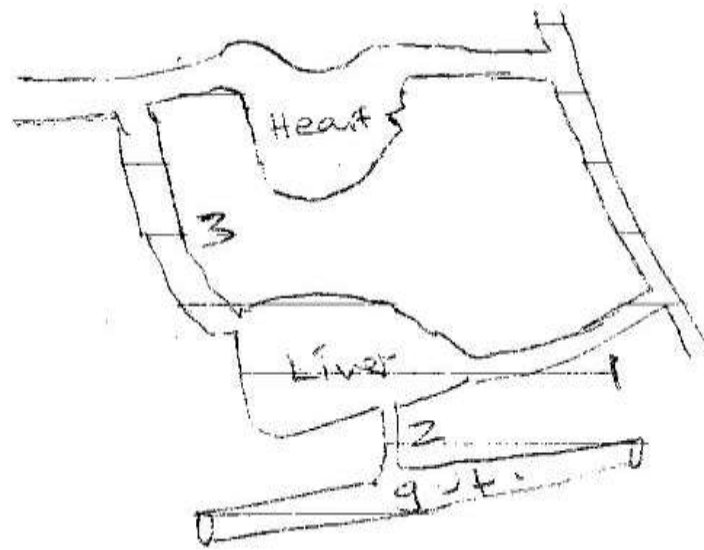
.....

Reason

.....

.....

21. The diagram below is a sketch showing the parts of a mammalian circulatory system.



a) Which blood vessel will have the highest concentration of glucose for a person who is fasting
(1Mark)

.....

b) State the name of the blood vessel labeled. (2Marks)

1.....

2.....

22. What is the function of the various parts of the mammalian ear? (3Marks)

Semicircular canals.

.....

Cochlea.

.....

Eustachean tube.

.....

23. State **three** differences between endocrine and nervous system. (3Marks)

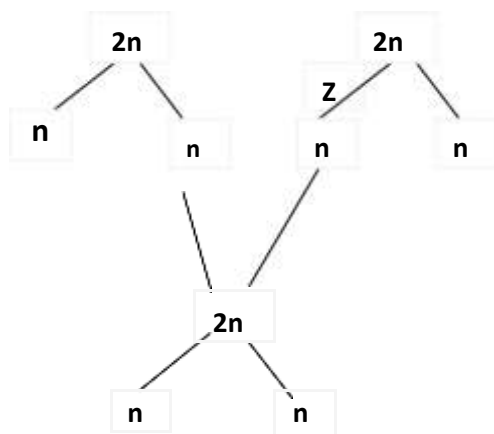
.....

.....

.....

.....

The chart below shows the number of chromosome before and after cell division and fertilizations in a mammal.



a) What type of cell division take place at Z? (1Mark)

.....

b) Where in the body of a female does process Z occur? (1Mark)

.....

c) i) Name the process that leads to addition or less of one or more chromosome. (1Mark)

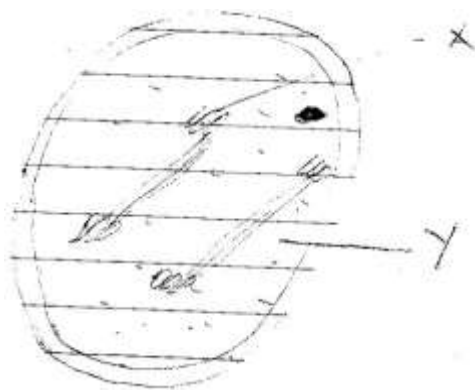
.....

ii) Name two conditions in man due to the process named in (i) above. (2Marks)

.....

.....

25. The diagram below represents a cell organelle.



a) Name the organelle. (1Mark)

.....

b) i) Name the part labeled Y. (1Mark)

.....

ii) State the function of the part labeled X (1Mark)

.....

26. a) State the name given to the growth curve in insects. (1Mark)

.....

b) State the advantages of metamorphosis to the life of the insect. (2Marks)

.....

.....

.....

c) What are the functions of the exoskeleton in the arthropods? (2Marks)

.....

.....

27. Distinguish between population and community. (2Marks)

.....

.....

.....

28. State the features that increase the surface area of the small intestines. (3Marks)

.....

.....

.....

PROJECTION NO. 48

NAME _____ INDEX NO. _____

CANDIDATE'S SIGNATURE _____

DATE _____

231/1

BIOLOGY

PAPER 1

(THEORY)

2 HOURS

INSTRUCTIONS TO CANDIDATES

This paper consists of 9 printed pages

Answer all questions in the spaces provided after each question

Write clearly and legibly

Question	
1-22	80 marks
Total score	

1. (a) What is a cell (1mk)

Define the meaning of the following terms

Entomology(1mk)

Genetics(2mks)

- (a) State the apparatus/equipment used in the laboratory to obtain the magnification of a specimen of a leaf (1mk)

- (b) Write the formula used to obtain the magnification of (a) above (1mk)

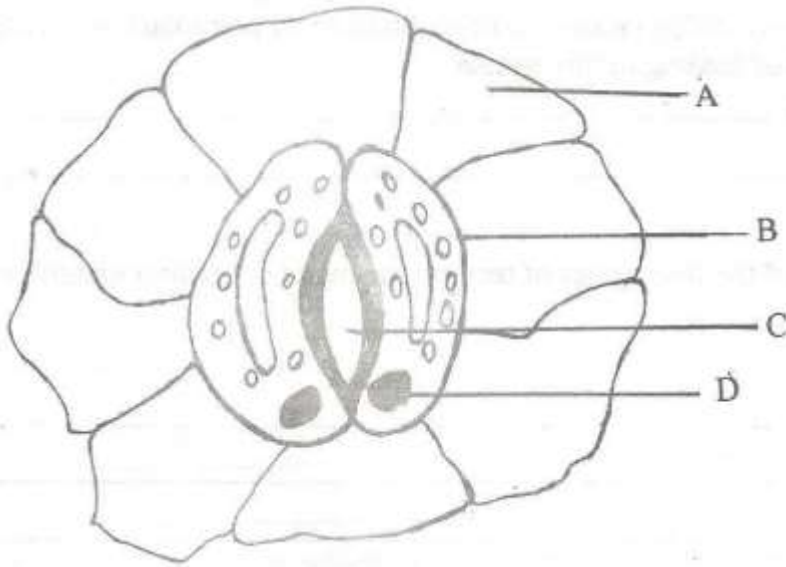
3. List two major characteristics of members of the same species (2mks)

State the functions of;

- (a) Rough Endoplasmic Reticulum (1mk)

- (b) Centrioles (1mk)

The diagram below represents a specialized plant structure



(a) Name the cells labelled A and B

(2mks)

A _____

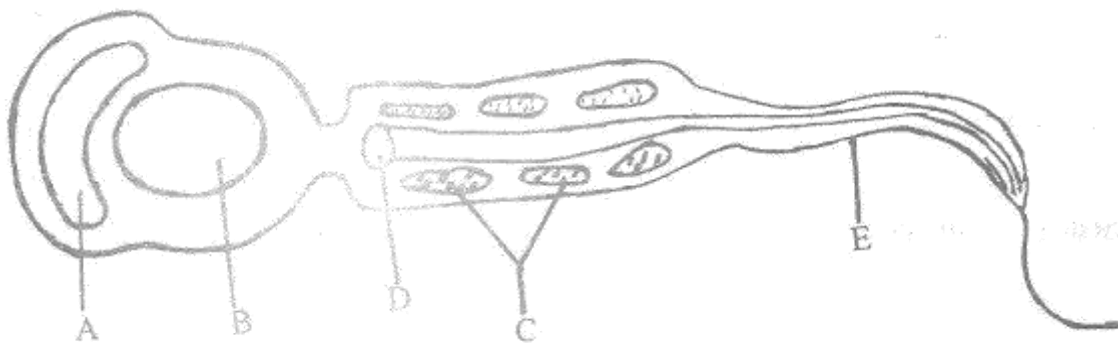
B. _____

(b) State the functions of structures C and D

(2mk)

C _____

D _____



The diagram above represents a specialized animal cell

(a) (i) Name the cell (1mk)

(ii) Name the parts labelled A and D (2mks)

A

D

(b) State the functions of the part labeled E. (1mk)

The following are characteristics of a certain animal dentition; large curved and sharply pointed canines, small closely fitting incisors, narrow molars and premolars with cusps

(i) Identify the likely mode of feeding in this animal (1mk)

(ii) State three adaptations of the three types of teeth to the mode of feeding identified in

(i) above

(3mks)

8. (a) Distinguish between the terms transpiration and Guttation

(2mks)

(b) State the structures through which each of the process named in (a) above occurs (2mks)

9. (a) State two structural adaptations of capillaries to their functions

(2mks)

(b) In which ways are the xylem vessels adapted to their functions (2mks)

10. (a) State the part of the brain that controls breathing movements in man (1mk)

(b) Explain how the aquatic plants are adapted to gaseous exchange (4mks)

11. State the organisms in which the following word reactions occur (2mks)

(a) (i) Glucose \longrightarrow Ethanol + carbon (IV) oxide + Energy

(ii) Glucose \longrightarrow Lactic acid + Energy

(b) What is meant by the term "oxygen debt" (3mks)

12. (a) Distinguish between taxon and taxonomy (2mks)

(b) Name two classes of the phylum Arthropoda that have cephalothorax (2mks)

13. Name four mechanisms through which plants excrete (4mks)

Study the food chain below

Green plant → Antelope → Lion

- (a) Draw a pyramid of biomass for food chain above (4mks)

- (b) Name the group of organisms not included in the food chain (1mk)

State the stage in meiosis where the following take place

(a) Disappearing of nucleolus (1mk)

(b) Formation of new spindle fibers (1mk)

(c) Formation of separate cells each with haploid number of chromosomes (1mk)

6.

16. State the relationship between auxins and the response phototropism (4mks)

Explain the following genetic terms

(a) Turner's syndrome

(2mks)

(b) Deletion

(2mks)

(c) Name one sex-linked trait carried in the y chromosome

(1mk)

18. (a) What is meant by organic evolution

(1mk)

(b) State three limitations in use of fossil records in retraceing the evolutionary history of all modern day organisms

(3mks)

7.

Name the structures of the human body concerned with the following;

(a) Maintenance of balance

(1mk)

(b) Hearing

(1mk)

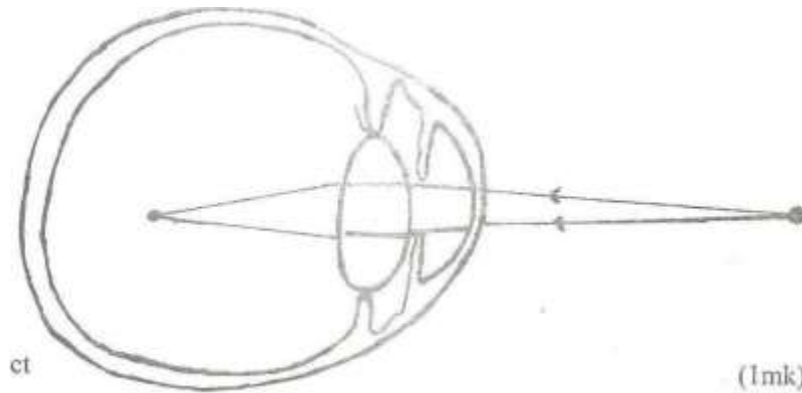
20. List three roles of the paired fins in fish

(3mks)

21. Differentiate between monoecious and dioecious plants

(2mks)

The figure below represents a human eye defect in humans



(i) Name the defect

(1mk)

(ii) State two causes of the defect

(2mks)

(iii) What kind of eye lenses can correct this defect

(1mk)

PROJECTION NO. 49

Name.....

Index No.....

School.....

Candidates Signature.....

Date:

231/1

BIOLOGY

(THEORY)

Paper 1

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES.

Answer all the questions in the space provided.

Additional pages **MUST** not be inserted.

Candidates may be penalized for false information and even wrong technical terms.

FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE SCORE
1-30	80	

This paper consists of 8 printed pages.

Candidates should check to ensure that all pages are printed as indicated and no questions are missing

1. (a) State **one** function of the plasma membrane. (1 Mark)

.....

.....

.....

(b) Give **two** functions of Golgi apparatus. (2 Marks)

.....

.....

2. Give an example of a sex-linked trait in human in:

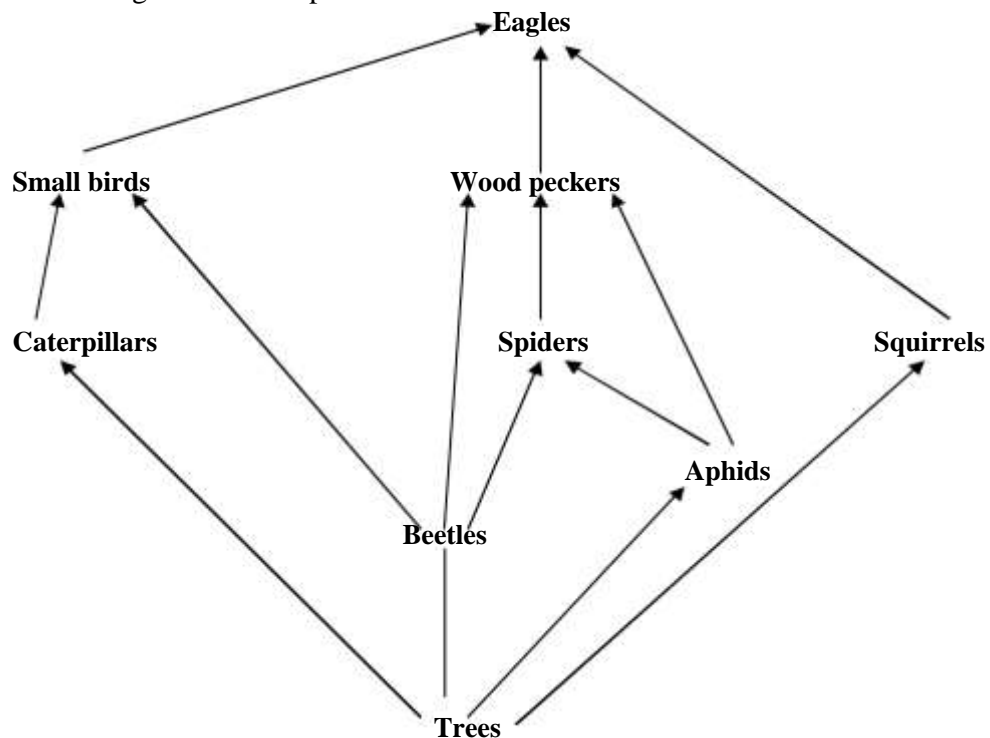
(i) Y – Chromosome (1 Mark)

.....

(ii) X – Chromosome (1 Mark)

.....

3. The diagram below represents a food web in a forest.



a. Construct a food chain ending with a tertiary consumer. (1 Mark)

.....

.....

.....

b. Name the highest trophic level occupied by the eagles. (1 Mark)

.....

c. What would happen if caterpillars are eliminated using an insecticide.

(2Marks)

.....

.....

A bone obtained from a mammal is represented by the diagram below.



a) Name the bone. (1 Mark)

.....

b) Which bones articulates with the bone shown in the diagram at the notch.

(2Marks)

.....

.....

5.What is the role of the following in the human body:-a)

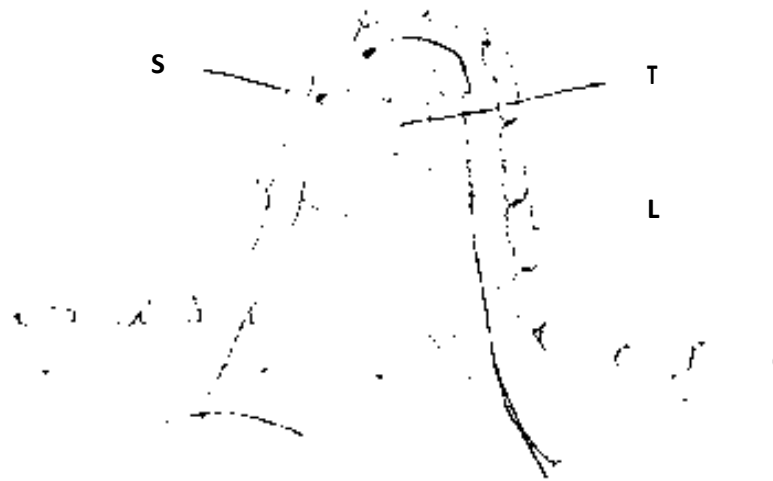
Vitamin K. (1Mark)

.....

b) Iron. (1 Mark)

.....

6. The diagram below represents part of the ileum lining.



a) Name the structure.

(1 Mark)

.....

b) Name the part labelled T.

(1 Mark)

.....

c) State how the above structure is adapted to its function.

(2Marks)

.....

.....

7. State **two** adaptations of alveoli to gaseous exchange.

(2Marks)

.....

.....

.....

8. Below is an animal cell undergoing cell division.

a) Name the type of cell division. (1 Mark)

.....

b) Where was the cell derived from? (1 Mark)

.....

c) Identify the stage of cell division shown by this cell. (1 Mark)

.....

A person was found to pass out large volume of dilute urine frequently. Name the:-

a) Disease the person was suffering from. (1 Mark)

.....

b) Hormone that was deficient. (1 Mark)

.....

10. Give a reason why each of the following steps is followed when preparing a Cross-section of a leaf for examination under a microscope.

a) Cutting very thin sections. (1 Mark)

.....

.....

b) Placing the sections in water. (1 Mark)

.....

.....

c) Staining the sections in iodine before observing under the microscope. (1 Mark)

.....

.....

11. State **two** ways in which active transport differs from diffusion. (2 Marks)

.....

.....

12. a) Why are people with blood group AB universal recipients? (2 Marks)

.....

.....

.....

b) Name the antibodies in blood group O. (1 Mark)

.....

13. a) Define organic evolution. (1 Mark)

.....

.....

b) Give **two** examples of vestigial structures. (2 Marks)

.....

.....

14. The central canal of the spinal cord is filled with. (1 Mark)

.....

15. a) Besides the abdomen name the other part of members of arachnida. (1 Mark)

.....

b) i) State **two** economic importance of members of kingdom fungi. (2 Marks)

.....
.....
.....

ii) What is the material composing the cell walls of organisms in kingdom fungi. (1 Mark)

.....

The oxidation of a certain food substance is expressed by a chemical equation shown below.



(a) Calculate the respiratory quotient. (2 Marks)

.....
.....
.....

(b) Name the class of food being oxidized (1 Mark)

.....

In an experiment it was observed that when maggots are exposed to light, they move to to areas. On the other hand, Euglena and chlamydomonas move towards light.

a) Name the type of response exhibited by the organisms. (1 Mark)

.....

b) State one advantage of the response shown by Euglena and Chlamydomonas (1 Mark)

.....

18. Explain the importance of Osmoregulation in organisms. (2 Marks)

.....
.....
.....

19. What is the causative agent of the following:-

a) Tuberculosis

(1 Mark)

.....

b) Bilharzia

(1 Mark)

.....

20. Which enzyme is responsible for breaking down sodium hydrogen carbonate in mammalian – blood to release Carbon (iv) Oxide? (1 Mark)

.....

List down **three** different types of muscles found in the mammalian body. (3 Marks)

.....
.....
.....

In nature plants are cross-pollinated rather than being self-pollinated.

a) List **three** features that hinder self-pollination in most plants.

(3 Marks)

.....
.....
.....
.....

b) State **one** advantage of cross-pollination in plants.

(1 Mark)

.....

23. Explain how xylem vessels are adapted to their function.

(2 Marks)

.....
.....
.....

24. State **two** ways of breaking seed dormancy.

(2 Marks)

.....
.....

25. a) Distinguish between epigeal and hypogeal germination. (2 Marks)

.....

.....

b) State the function of coleoptile in the maize seedling. (1 Mark)

.....

.....

.....

26. Give the functions of the following parts of human eye.

a) Lens (1 Mark)

.....

b) Ciliary body (1 Mark)

.....

c) Cornea (1 Mark)

.....

27. What is the role of the following hormones in the mammalian reproductive System?

a) Testosterone. (1 Mark)

.....

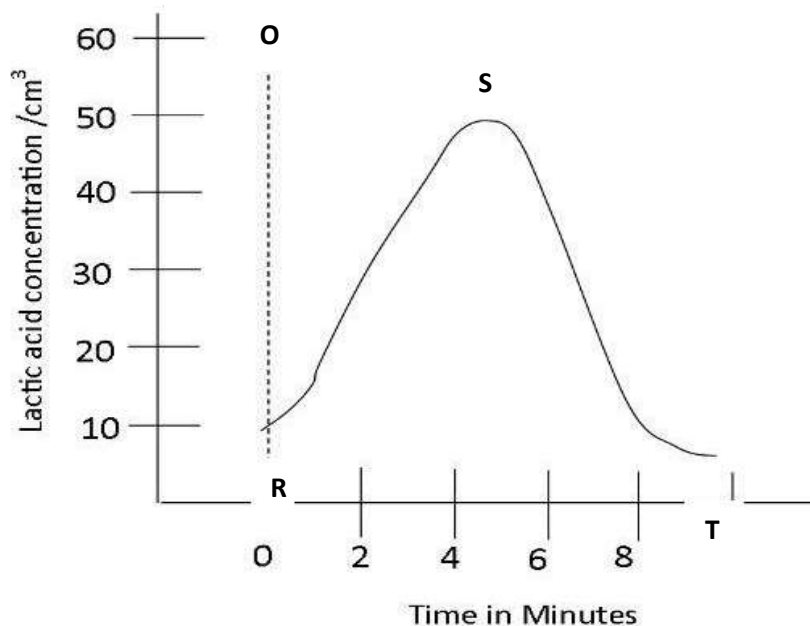
b) Progesterone. (1 Mark)

.....

c) Luteinising hormone. (1 Mark)

.....

The diagram below shows the general appearances of lactic acid in the blood of an athlete after an exercise.



- a) What is the significance of the line marked O? (1 Mark)

.....

- b) Explain what was happening in the body between points:

- (i) R and S. (1 Mark)

.....

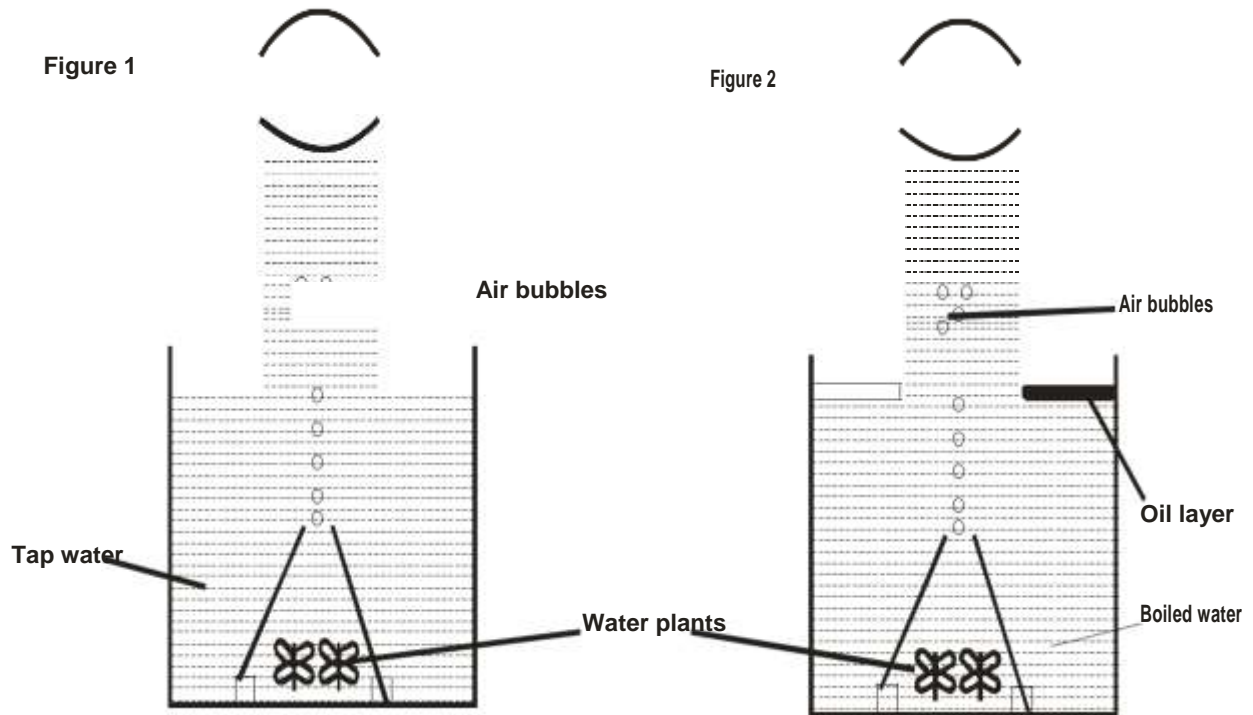
- (ii) S and T. (1 Mark)

.....

- c) What is oxygen debt? (1 Mark)

.....

Figure 1 and 2 show two set of apparatus used by a group of students to investigate some physiological process. The apparatus were put in bright light for sometime some air bubbles were evolved in figure 1 while no change was observed in figure 2.



a) Name the gas responsible for air bubbles in figure 1. (1 Mark)

.....

b) i) Account for the formation of bubbles in figure 1 and not in figure 2. (2 Marks)

.....

(ii) Which one of the set up's was the control experiment? (1 Mark)

.....

30. The study of insects is known as (1 Mark)

.....

PROJECTION NO. 50

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

SIGN:.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided at the top of this page.

Sign and write the date of examination in the spaces provided above.

Answer all the questions.

Answers must be written in the spaces provided in the question paper.

Additional pages must not be inserted.

FOR EXAMINERS USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
	1–31	80	

This paper consists of 8 printed pages.

Candidates should check the question paper to ensure that all pages are printed as indicated and that no questions are missing.

Answer ALL questions in the spaces in this paper

1. Name two components of blood that are not present in glomerular filtrate. (2mks)

i).....

ii).....

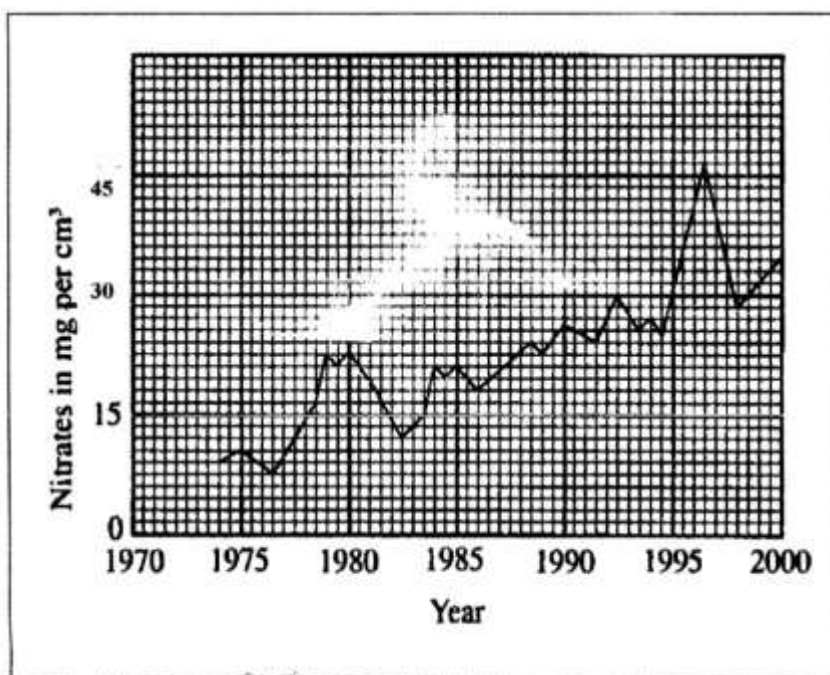
2. State the difference between photosynthesis and chemosynthesis. (2mks)

.....

.....

.....

Use the graph below to answer the question that follow.



- a) Calculate the difference in nitrate concentration between the highest and lowest. (1mk)

- b) How can increase in nitrate concentration in the river lead to death of fish? (2mks)

Suggest two possible sources of nitrate that lead to the pollution in river.

4. a) What is meant by the term binomial nomenclature. (1mk)

.....

.....

.....

A dog is called *Canis familiaris*. Name the taxonomic unit represented by *canis*. (1mk)

5. a) State the phylum where all members have open circulatory system. (1mk)

.....

b) Explain the advantages of closed circulatory system over open circulatory system.

(2mks)

.....

.....

.....

.....

The following is an equation representing a type of respiration



- a) Identify the type of respiration. (1mk)

.....

- b) Suggest one industrial application of the process name in (a) above. (1mk)

.....

State two features of leaves which enable a plant to reduce the loss of water.

.....

.....

Name the cell organelles responsible for :

Protein synthesis

.....

Destroying worn – out organelles and cells

.....

- a) Lietego school biology student used a microscope with x40 objective lens and x5 eye piece lens which had 2mm radius. Calculate the area of the field of view in micrometers.

(2mks)

b) What is the average size of the cell in micrometers (2mks)

.....

.....

.....

10. Give two functions of the exoskeleton in arthropods. (2mks)

.....

.....

.....

.....

11. a) Name the site of gaseous exchange in mammals. (1mk)

.....

.....

b) State one characteristics of the site named in (a) above. (1mk)

i).....

ii)

iii)

The chemical equation below represents a physiological process that takes in living organisms

Name $C_6H_{12}O_6 + C_6H_{12}O_6 \longrightarrow C_{12}H_{22}O_{11} +$

Q

i) the process R (2mks)

.....

substance Q

.....

13. a) Distinguish between homologous and analogous structures in evolution (2mks)

.....

.....

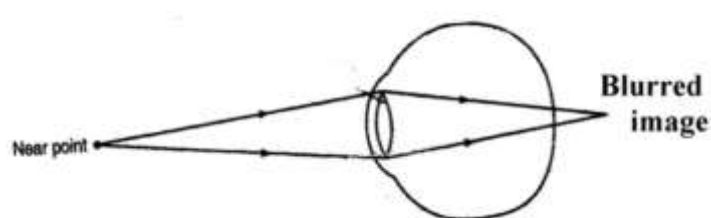
.....

.....

- b) Give an example of a vestigial structure in human beings. (1mk)

.....

The illustration below represents an eye defect.



- a) Name the eye defect (1mk)

.....

.....

- b) How can the defect be corrected? (1mk)

.....

.....

.....

Name two classes of phylum arthropoda with cephalothor.

.....

ii)

iii)

16. State three roles of placenta during pregnancy. (3mks)

i)

ii)

iii)

Name the part of an ovule that develops into each of the following parts of a seed after fertilization. (2mks)

Testa

.....

Endosperm

.....

Explain how the following tissues are adapted to provide mechanical support in plants

Collenchyma(2mks)

.....

.....

.....

Sclerenchyma

.....

.....

.....

Two equal strips A and B were from a potato whose cell was 30% of sugar. The strip A was placed in a solution of 10% sugar concentration while strip B was placed in 50% sugar

Concentration

a) What change was expected in strips A and B? (2mks)

A

.....

B.....

b) Account for the change in strip A. (2mks)

.....

.....

.....

When shoots of young plants were exposed to unidirectional source of light, they bend towards light.

a) Name the type of response exhibited by the young shoots. (1mk)

.....

b) Explain the cause of the observation above. (3mks)

.....

.....

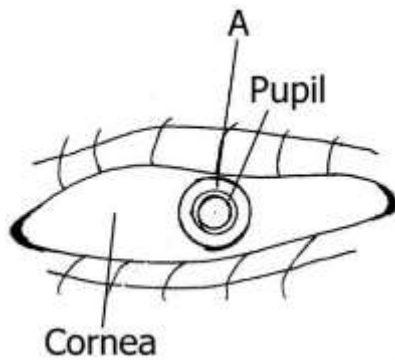
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.....

.....

Study the drawing and answer the questions below.



- a) Name the part labelled. A (1mk)

.....

- b) Describe the changes that occur in the structure A in dim light. (2mks)

.....

.....

.....

.....

- c) What is mean by the term accommodation with reference to the eye? (1mk)

.....

.....

.....

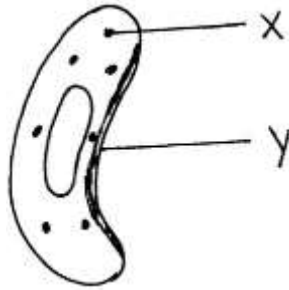
State any three factors that can influence reduction in the population of herbivores in a national part.

i)

ii)

iii)

The diagram below represents a cell



Name the parts labelled

X

Y

b) State the role of the cell (1mk)

.....
.....
.....

25. Name the hormone responsible for: (2mks)

osmoregulation

.....

reabsorption of mineral salts.

.....

A man of blood group A (heterozygous) marries a woman of blood group O. What are the possible blood groups of their children? (2mks)

.....

.....

.....

.....

The diagram below represents a bone obtained from the hind limb of a goat.



a) Identify the bone (1mk)

.....

b) Name the type of joint formed at the part labelled T. (1mk)

.....

During germination and early growth the dry weight of endosperm decreases while that of the embryo increases. Explain. (2mks)

.....

.....

.....

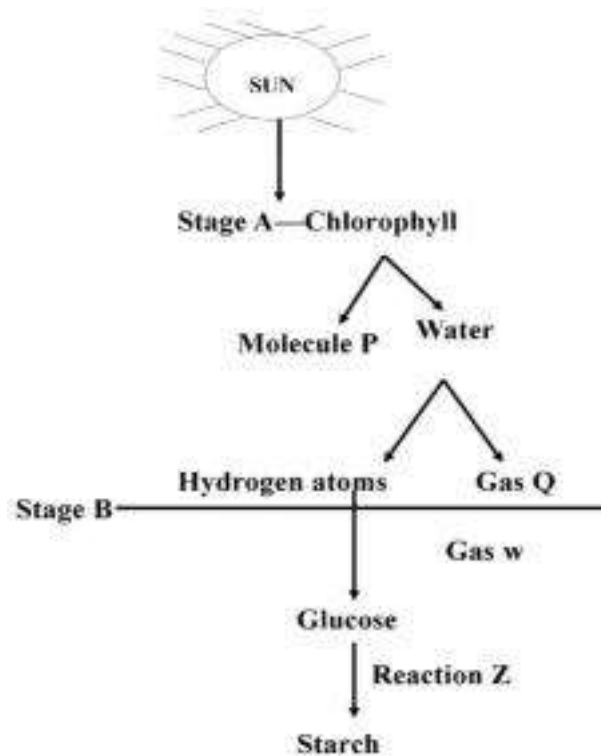
.....

State one structural different between the sensory neuron and motor neuron. (1mk)

.....

Below is a diagrammatic summary of the main biochemical events in photosynthesis.

Study it carefully and answer the questions that follow.



a) Suggest the identify of molecule P. (1mk)

.....

Name the gases represented by the letters

Q

.....

W

.....

Name the specific site for the reactions in stage B

.....

d) Name reaction Z. (1mk)

Z

i) Give two examples of gene mutation traits in human beings . (2mks)

i)

ii)

PROJECTION NO. 51

END

NAME:.....INDEX

SCHOOL:.....SIGNATURE.....

DATE.....

231/1

BIOLOGY

PAPER 1

(Theory)

TIME: 2HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided.

Answer ALL the questions in the spaces provided,

FOR EXAMINERS USE ONLY

Question	Maximum score	Candidates score
1-27	80	

Explain the following terms.

a) Taxonomy (1mrk)

.....

.....

.....

b) Species (1mrk)

.....

.....

.....

2. State **three** features used in classifying arthropods into classes. (3mrks)

.....

.....

.....

.....

.....

.....

a) **Name** the substance that accumulates in muscles when respiration occurs with insufficient Oxygen.(1mrk)

.....

.....

b) Give the **three** end products of anaerobic respiration in plants. (3mrks)

.....

.....

.....

.....

.....

4. a) State **three** characteristics of a wind pollinated flower. (3mrks)

.....

.....

.....

.....

b) **Explain** why sexual reproduction is important to organisms. (1mrk)

.....

.....

.....

5. **State** the functions of the following organelles.

a).Lysosomes (1mrk)

.....

.....

c) Golgi apparatus (1mrk)

.....

.....

6. What is the role of vascular bundles in plant nutrition? (3mrks)

.....

.....

.....

.....

.....

Haemophilia is a genetic disorder which is transmitted through a recessive gene linked to the X chromosome. Using **H** to represent the normal gene and **h** for haemophilia, work out the genotypic ratio of the offspring of a marriage between a woman who is carrier for haemophilia gene and a normal man. (4mrks)

8. a) In what form does energy enter the earth's ecosystem? (1mrk)

.....

b) What is the main source of energy in an ecosystem (1mrk)

.....

.....

c) In what form does energy transferred from one trophic level to another? (1mrk)

.....

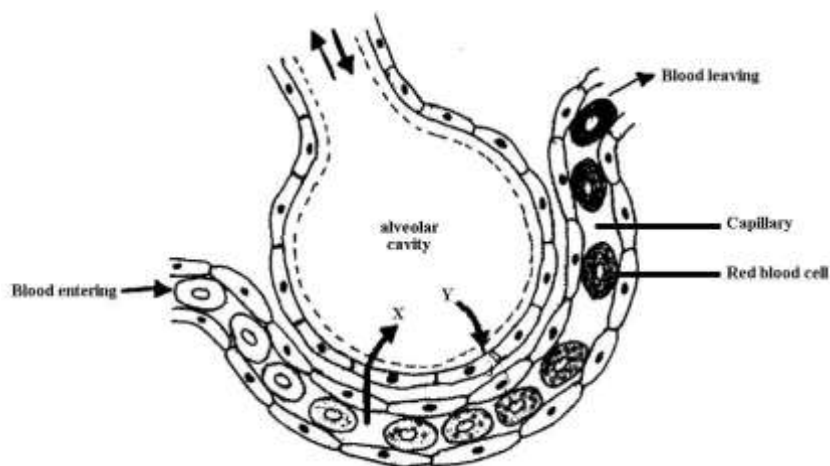
.....

d) If only a small fraction of energy is transferred from one trophic level to another, what happens to the rest of the energy? (1mrk)

.....

.....

9. The diagram below represents gaseous exchange in the alveolus.



a). Identify the gases labeled X and Y. (2mrks)

.....

.....

.....

b). Trace the path followed by gas Y from alveolar space until it reaches the red blood cells. (3mrks)

.....

.....

.....

c). **Name** the part of the brain that controls breathing movement in humans. (1mrk)

.....

.....

.....

10. The table below shows the energy use per day in kilojoules

Age(years)	Male	Female
2	5,500	5,500
5	7,000	7,000
8	8,800	8,000
11	10,000	9,200
14	12,500	10,500
18	14,200	9,600
25	12,100	8,800

a).From the table, explain why after age 8 males require more energy than females. (1mrk)

.....

.....

.....

b). Other than sex and age, name **three** other factors that determine energy requirements in human beings (3mrks)

.....

.....

.....

.....

.....

11. a) Define organic evolution. (1mrk)

.....

.....

.....

b). Give the role played by variation in the process of evolution. (2mrks)

.....

.....

.....

12. a) What are halophytes? (1mrk)

.....

.....

.....

b) **State three** adaptations of halophytes to their habitats. (2mrks)

.....

.....

.....

.....

.....

.....

13. a) **Name** the causative agent of the following diseases in humans. (2mrks)

Syphilis.....

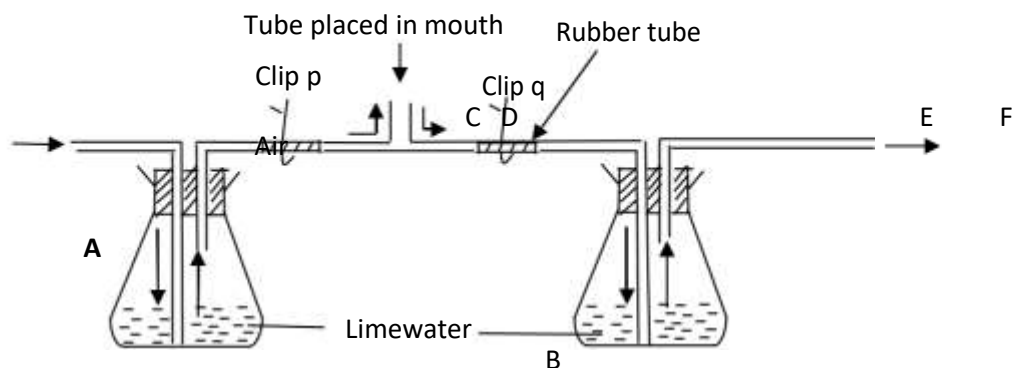
Herpes.....

b). State the functions of the following structures. (2mrks)

Fallopian tube.....

Amniotic fluid.....

14. An experiment was set up as shown below to compare the amount of carbon (iv) oxide in expired and inspired air.



a). **State** the purpose of the clip (2mrks)

i). P.....

ii). Q.....

b). Compare the observations in flask A and B after the experiment. Give reasons for your answer. (2mrks)

.....

.....

.....

.....

15. **Name** the form in which carbohydrates are stored in. (2mrks)

i). Plants tissues

.....

ii). Animal tissues

.....

16. **Explain** how water is gained from the soil by root hairs in plants. (3mrks)

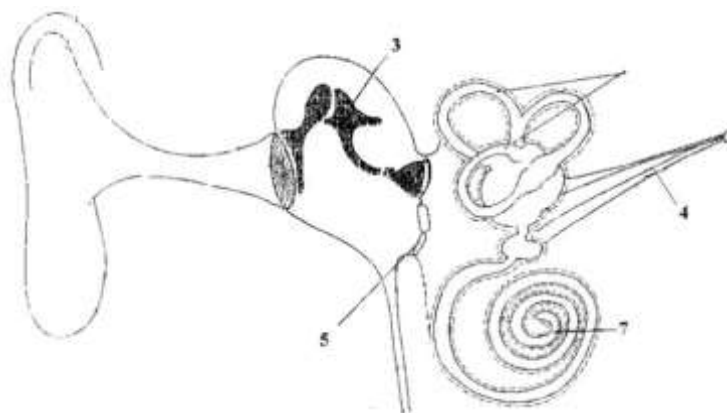
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.....

17. The diagram below shows the human ear.



a). Name the structures labeled 3, 4 (2mrks)

.....

.....

.....

.....

b). **State** the function of the parts labeled 5 and 7. (2mrks)

.....

.....

.....

18. Give the survival value of the following tropic responses

a). Geotropism (1mrk)

.....

.....

.....

b). Haptotropism (1mrk)

.....

.....

.....

c). Chemotropism

(1mrk)

.....

.....

.....

19. Distinguish between **single** and **double** circulatory systems.

(1mrk)

.....

.....

.....

20. Name **one** disorder caused by a dominant gene.

(1mrk)

.....

.....

.....

21. Name the spore producing structures in pteridophytes.

(1mrk)

.....

.....

.....

22. a). Define transpiration.

(1mrk)

.....

.....

.....

b). State **two** environmental factors that decrease the rate of transpiration.

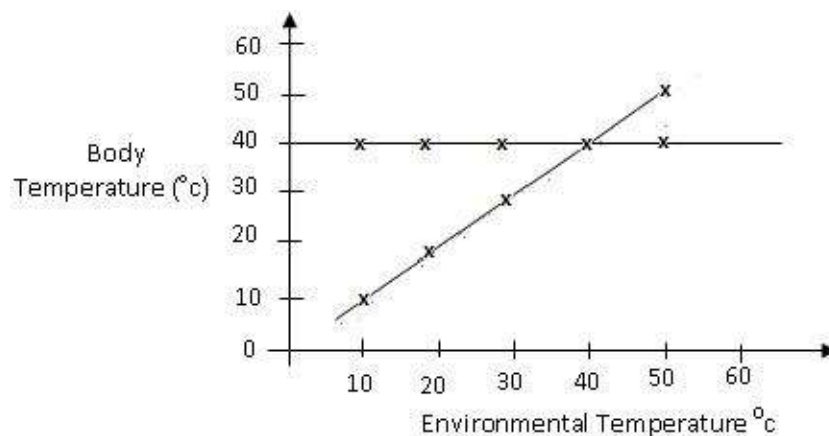
(2mrk)

.....

.....

.....

The graph below shows the relationship between environmental temperature and the body temperature in two different animals A and B.



a). **State** the relationship between the body temperature of animal A and external environmental temperature. (1mrk)

.....

.....

.....

b). Give the term used to describe;

i). Animals of type A

.....(1mrk)

ii). Animals of type B

.....(1mrk)

24. Nitrogen in the atmosphere cannot be directly utilized by plants. **State two** ways by which this Nitrogen is made available for plant use. (2mrk)

.....

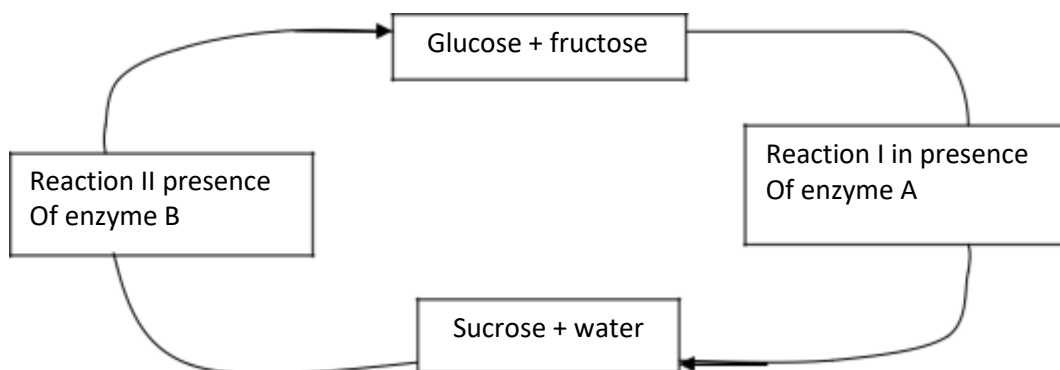
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.....

The diagram below shows chemical reaction I and II which are controlled by enzyme A and B.



Name the reaction I and enzyme B

(2mrks)

Reaction

I.....

Enzyme

B.....

26. **State two** main functions of a microscope.

(2mrks)

.....

.....

.....

.....

27. in what form is carbon (IV) oxide transported in blood.

(2mrks)

.....

.....

.....

.....

.....

.....

PROJECTION NO. 52

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

231/1

BIOLOGY

PAPER I

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1–28	80	

This paper consists of 8 printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

Some form one students wanted to collect the following animals for study in the laboratory.

State the suitable apparatus they should use.

i) Flying insects (1 mark)

.....

ii) Crawling stinging insects (1 mark)

.....

iii) Small animals from tree barks (1 mark)

.....

2. a) State the role of enzyme catalase in living cells (2 mark)

.....

.....

b) Which factor inactivates enzyme action? (1 mark)

.....

.....

State the transport and synthetic roles of endoplasmic reticulum

i) Transport role (1 mark)

.....

.....

ii) Synthetic role (1 mark)

.....

.....

4. a) What is test cross? (1 mark)

.....

.....

b) What are homologous chromosomes? (1 mark)

.....

.....

5. a) What is the significance of diffusion to plant pollination (1 mark)

.....

.....

Explain why movement of air molecules is not energy driven process (1 mark)

.....

.....

6. a) Name two products of anaerobic respiration in animals (2 mark)

.....

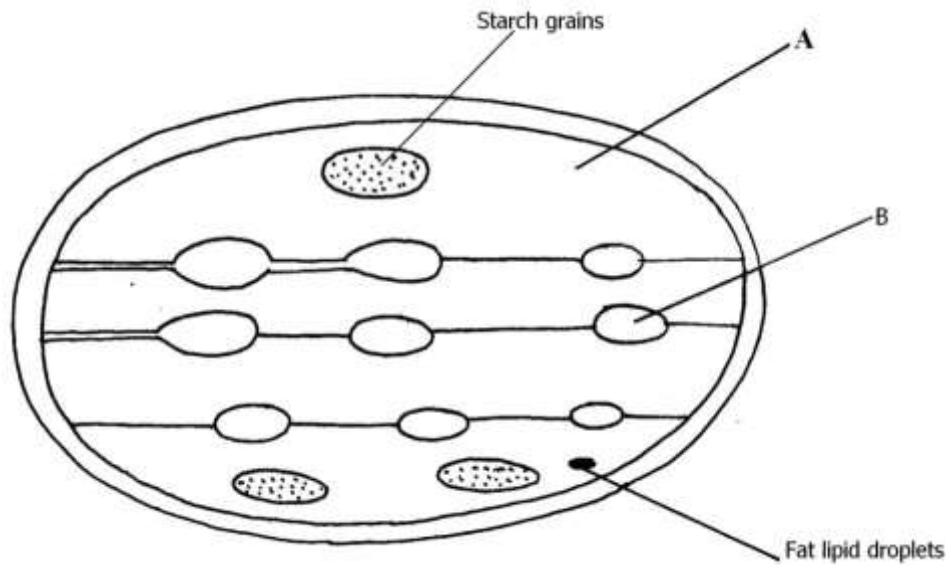
.....

b) Define the term respiratory quotient (1 mark)

.....

.....

7. Study the diagram below and answer the questions that follows (1 mark)



- a) Identify the structures labeled A and B (2 mark)

A

B

- b) What process takes place in the parts labeled A and B (2 mark)

.....
.....
.....

8. State two distinguishing characteristics of members of division Bryophyta (2 mark)

.....
.....
.....

9. Name the organisms that cause: (2 mark)

Malaria

.....

Sleeping sickness

.....

10. a) Differentiate between transpiration and guttation (2 mark)

.....

.....

.....

b) State two conditions that are necessary for opening of the stomata (2 mark)

.....

.....

.....

11. State two functions of smooth muscle along alimentary canal in mammals. (2 mark)

.....

.....

.....

12. List the three modes of expressing food relationship in an ecological system (3 mark)

.....

.....

.....

13. a) What is eye accommodation? (1 mark)

.....

.....

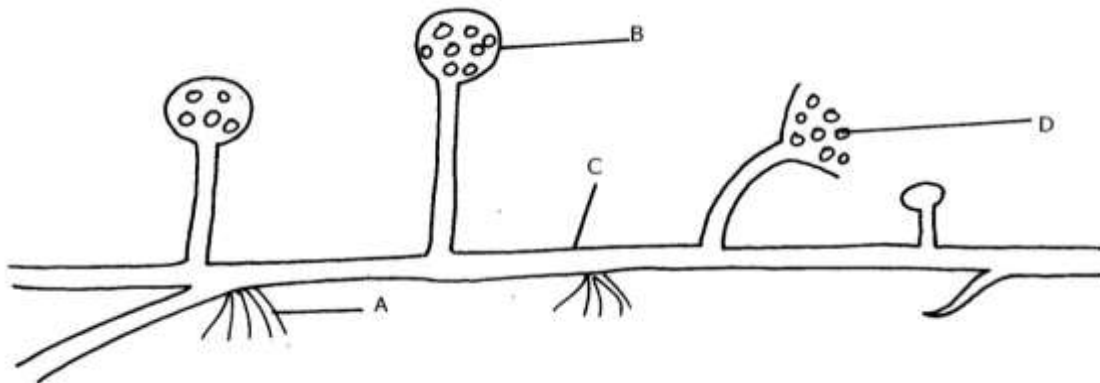
Explain how the iris muscle controls the size of pupil when exposed to bright light. (2 mark)

.....

.....

.....

The figure below shows part of a mould growing on a substrate



- a) Name the kingdom to which it belong (1 mark)

.....

- b) Name the parts labeled B, C, and D (3 mark)

.....

.....

.....

.....

c) State the function of part A (1 mark)

.....

.....

Explain the effects of vigorous exercise on

a) Breathing rate (1 mark)

.....

.....

b) Pulse rate (1 mark)

.....

.....

c) Arterioles of a person (1 mark)

.....

.....

16. a) Distinguish between pyramid of numbers and pyramid of biomass (2 mark)

.....

.....

.....

Briefly describe how the belt transect can be used in estimating the population of a shrub in a grassland (2 mark)

.....

.....

.....

.....

a) State two advantages which a constant body temperature gives mammals and birds over the animals (2 mark)

.....

.....

.....

b) How does the body size affects heat loss in an animal (1 mark)

.....

.....

A cross between a black bull and a white cow produces a calf which has black and white spots.

a) State the type of dominance shown. (1 mark)

.....

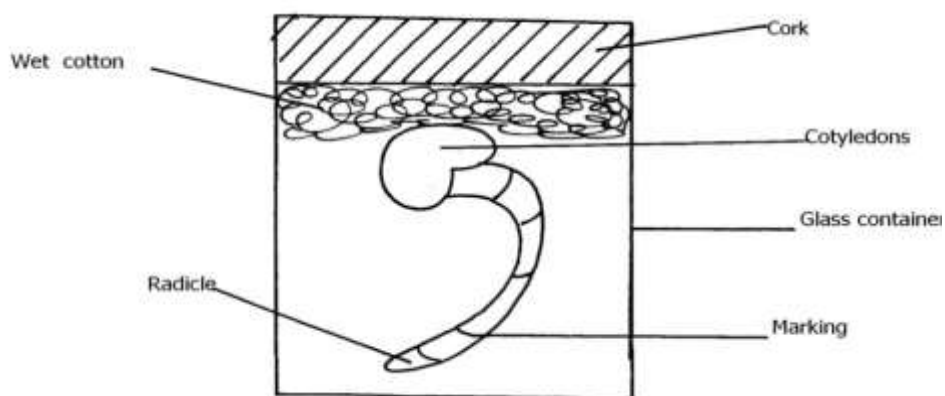
.....

Suggest the possible genotypes of the calf if the genes for white and black trait are B and W respectively. (1 mark)

.....

.....

A student set up an experiment as shown in the diagram below.



d) What was the aim of the experiment? (1 mark)

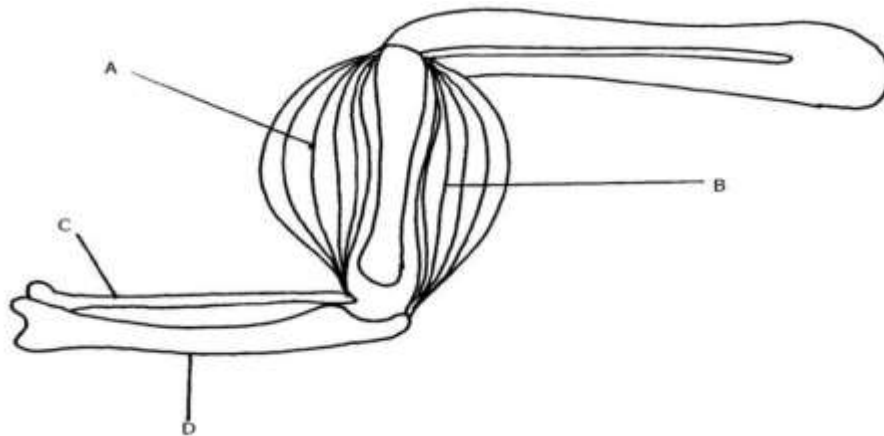
.....

..... e)

On the diagram below indicate the expected results after three days. (2 mark)



20.



a) Name the bones labeled C and D. (2 mark)

.....

.....

.....

b) What happens to structure A and B as the arm is straightened (1 mark)

.....

.....

21. a) What are the vestigial structures? (1 mark)

.....

.....

b) Give two examples of the structures above in man. (2 mark)

.....

.....

.....

22. a) What is seed dormancy? (1 mark)

.....

.....

b) Name a growth inhibitor in seeds (1 mark)

.....

.....

c) Differentiate between hypogeal and epigeal germination in seeds (2 mark)

.....

.....

.....

The diagram of the Nucleolus of a liver cell of a rat in an electron micrograph was 8.0 mm.

Calculate the actual diameter of the Nucleolus in micrometers given the magnification was X16000. (2 mark)

.....

.....

.....

a) Explain why tracheids are not efficient in transporting water up the plant. (1 mark)

.....

.....

b) What is the advantage of xylem vessels being dead? (1 mark)

.....

.....

An accident victim was found to pass large volumes of dilute urine.

a) What part of the brain was injured? (1 mark)

.....

.....

Explain how injury of the part mentioned in 25(a) above brought about release of large volume of urine. (3 mark)

.....

.....

.....

.....

.....

.....

The following nucleotide sequence was AGCCT on a segment of DNA strand.

i) Write down the sequence in corresponding segment of DNA strand (2 mark)

.....

.....

.....
.....
ii) Find the complementary strand from the original sequence of RNA. (1 mark)

.....
.....
27. a) Define the term active transport (1 mark)

.....
.....
.....
.....
Name two environmental factors that influence the rate of active transport.(2 mark)

.....
.....
28. State three unique features of a class insect. (3 mark)

.....
.....
.....
.....
END

PROJECTION NO. 53

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

231/1

BIOLOGY

PAPER I

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

Candidates check the question paper to ascertain that all the papers are printed

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1–32	80	

This paper consists of 8 printed pages. Candidates should check the question paper to ensure that all pages are printed as indicated and that no questions are missing.

1. What components of blood are absent in the tissue fluid (2mks)

.....

.....

2. (a) What is a cell. (1mk)

.....

.....

Define the meaning of the following terms

Entomology(1mk)

.....

.....

- (ii) Genetics (2mks)

.....

.....

3. (a) Name the association between leguminous plant and rhizobium bacteria (1mk)

.....

.....

- (i) State the population estimation method of grasshoppers in your school compound.

(1mk)

.....

.....

- (ii) Suggest the name of the formula used to calculate population of the grasshoppers.

.....

.....

State the organelles that would be abundant in

(a) Palisade cell

(2mks)

.....

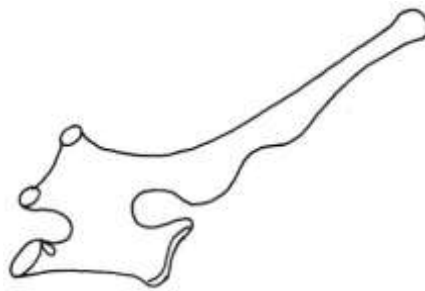
.....

Skeletal muscle cell

.....

.....

The diagram below represents a mammalian vertebra.



(a) Identify the vertebra represented above.

(1mk)

.....

.....

(b) Give a reason for your answer.

(1mk)

.....

.....

State the functions of;

(a) Rough Endoplasmic Reticulum

(1mk)

.....

.....

(b) Centrioles (1mk)

.....

.....

State any three theories that explain the mechanism of opening and closing of stomata. (3mks)

.....

.....

.....

The following are characteristics of a certain animal dentition; large curved and sharply

Pointed canines, small closely fitting incisors, narrow molars and premolars with cusps

(i) Identify the likely mode of feeding in this animal (1mk)

.....

.....

State three adaptations of the three types of teeth to the mode of feeding identified in

(i) above(3mks)

.....

.....

.....

.....

A student visiting a game park observed that an adult elephant flapping its ears twice as much as its calf in order to cool its body when it is hot. Explain (2mks)

.....

.....

.....

.....

Name one function of,

(a) Progesterone (1mk)

.....

.....

(b) Luteinizing hormone (1mk)

.....

.....

11.(a) Distinguish between the terms transpiration and Guttation (2mks)

.....

.....

.....

.....

State the structures through which each of the process named in (a) above occurs
(2mks)

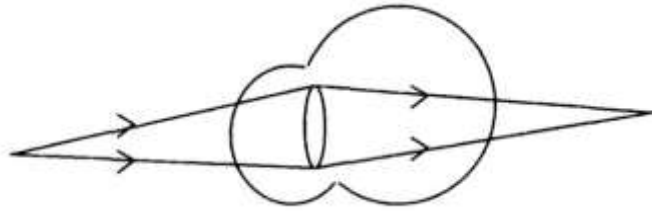
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The diagram below shows the position of an image formed in a defective eye.



(a) Name the defect..... (1mk)

Explain how the defect name in (a) above can be corrected (1mk)

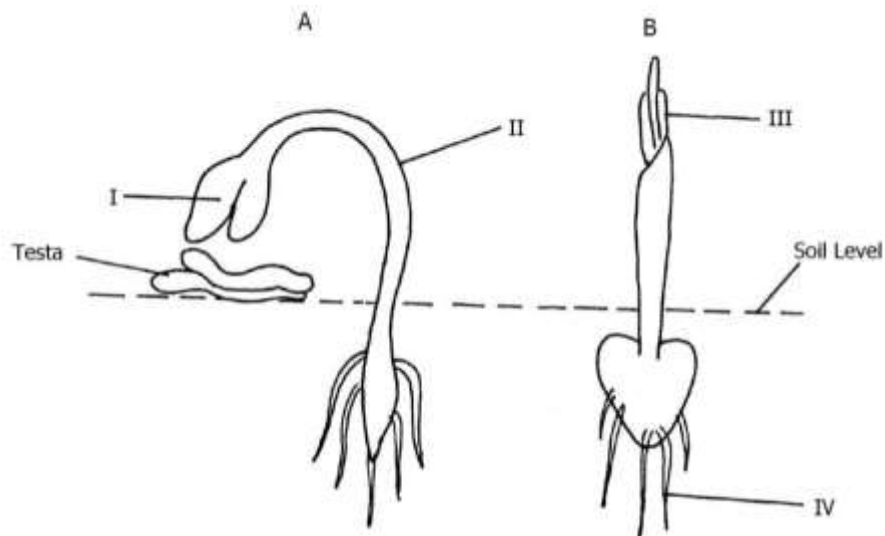
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.....

The diagram below represents a stage of growth in two different seedlings.



(a) Identify the type of germination exhibited B. (1mk)

.....

.....

(b) State the functions of part labeled I and IV. (2mks)

I

IV

14.(a) State the part of the brain that controls breathing movements in man (1mk)

.....

.....

(b) Explain how the aquatic plants are adapted to gaseous exchange (4mks)

.....

.....

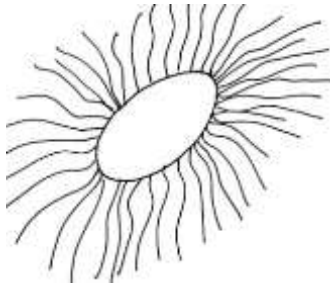
.....

.....

.....

.....

The diagram below shows a seed of a certain plant.



(a) Name the likely agent of dispersal. (1mk)

.....

(b) Give a reason for your answer. (1mk)

.....

16. (a) Distinguish between taxon and taxonomy (2mks)

.....

.....

- (b) Name two classes of the phylum Arthropoda that have cephalothorax (2mks)

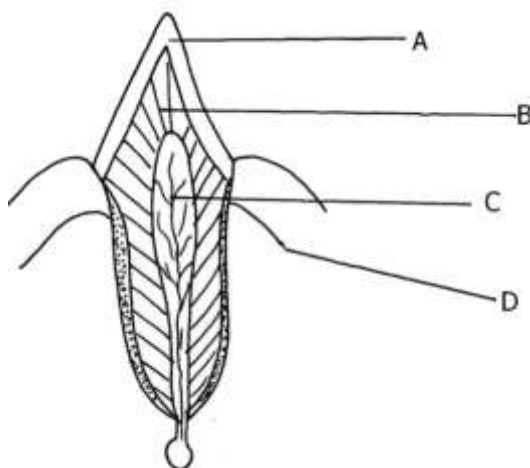
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17. (a) Name the source of hydrochloric acid in the mammalian stomach. (1mk)

.....

The diagram below represents internal structure of a mammalian tooth.



- (c) Name part labeled B and D (2mks)

B.....

D.....

18. Distinguish between gene and chromosomal mutation. (2mks)

.....

.....

19. Differentiate between intracellular and extracellular enzymes. (2mks)

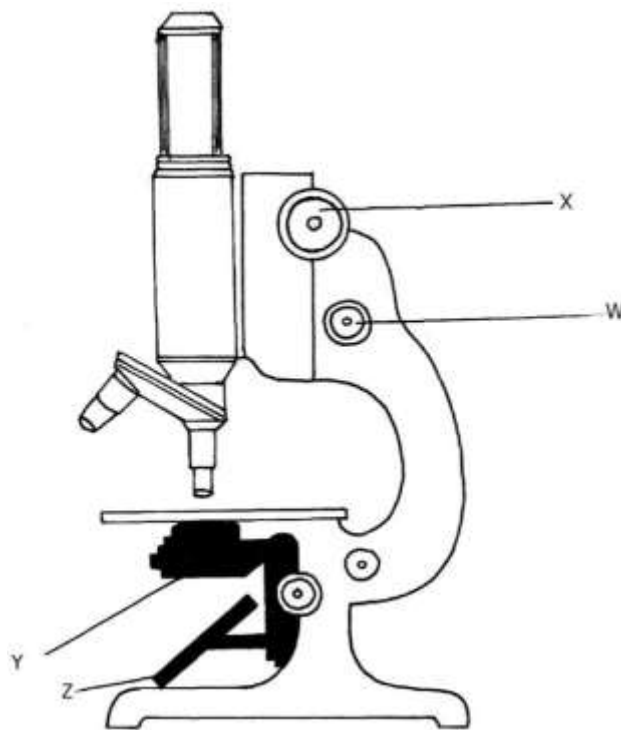
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.....

The diagram below represents a common laboratory equipment.



- (i) Label the parts labeled X and Y. (2mks)

.....

Y.....

- (ii) Using arrows show how the object is illuminated. (2mks)

21. What is the main functions of vascular bundles. (2mks)

.....

.....

.....

.....

State the stage in meiosis where the following take place

(a) Disappearing of nucleolus (1mk)

.....

(b) Formation of new spindle fibres (1mk)

.....

(c) Formation of separate cells each with haploid number of chromosomes (1mk)

.....

Explain the following genetic terms

(a) Turner's syndrome (2mks)

.....

.....

.....

(b) Deletion (2mks)

.....

.....

(c) Name one sex-linked trait carried in they chromosome (1mk)

.....

24. (a) What is meant by organic evolution (1mk)

.....

State three limitations in use of fossil records in retracing the evolutionary history

of all modern-day organisms (3mks)

.....

.....

.....

.....

25. Differentiate between monoecious and dioecious plants (2mks)

.....

.....

.....

.....

26. State three advantages of metamorphosis to the life of insects (2mks)

.....

.....

.....

State the function of the following apparatus

- (a) a pooter (1mk)

.....

.....

(b) a pit fall trap (1mk).

.....

.....

28.(a) Distinguish between Natural and acquired immunity (1mk)

.....

(b) (i) Define the term Allergy (1mk)

.....

(ii) List two causes of allergy in humans (2mks)

.....

.....

PROJECTION NO. 54

Name.....

Index No...../.....

School.....

Date

Candidate's Signature.....

231/1

BIOLOGY

(THEORY)

Paper1

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number and the Name of your school in the spaces provided above.

Sign and write the date of examination into each space provided above

Answer ALL the questions in the spaces provided.

State the functions of the following points of a light microscope.

Diaphragm(1mk)

.....

Condenser(1mk)

.....

State the functions of the following organelles.

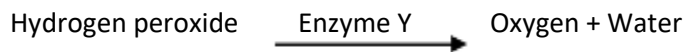
Nucleolus(1mk)

.....

Ribosomes(1mk)

.....

The reaction represented by the equation below occurs in the body.



(a) Name enzyme Y. (1mk)

.....

(b) Name an organ in the body where the reaction occurs. (1mk)

.....

(c) What is the significance of the reaction (1mk)

.....

.....

4. (a) Name two disorders in man that occur through gene substitution (2mks)

.....

.....

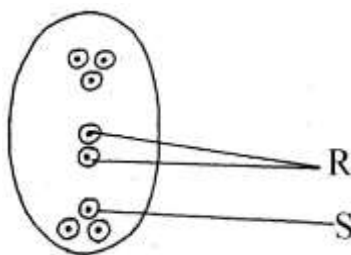
(b) Give two advantages of polyploidy in plants. (2mks)

.....

.....

.....

Study the diagram of the embryo sac below and answer questions that follow.



(a) Name the type of fertilization that occurs in the embryo sac. (1mk)

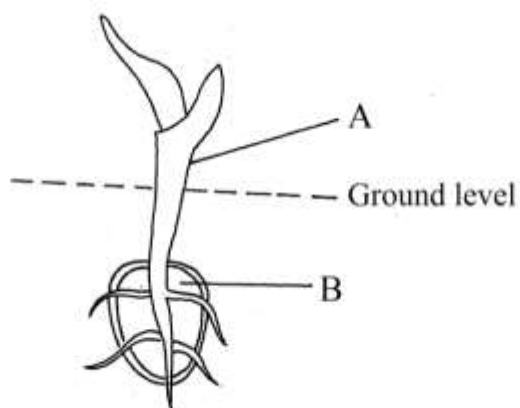
.....

(b) What do the structure labelled R and S develop into after fertilization. (2mks)

R.....

S.....

The diagram below represents a maize seedling



(a) (i) Name the type of germination exhibited by maize. (1mk)

.....

(ii) Give a reason for your answer in (a) (i) above. (1mk)

.....

(b) State the functions of the parts labelled A and B. (2mk)

A.....

B.....

(a) Explain how the following factors control population.

Predation(1mk)

.....

.....

Competition(1mk)

.....

.....

Parasitism(1mk)

.....

.....

A cat was used to control the population of rats.

(i) What term is used to refer to this method. (1mk)

.....

- (ii) State one advantage of using the method you named in (i) above. (1mk)

.....

State the role played by the following substance in digestion.

- (i) Hydrochloric acid (2mks)

.....

.....

- (ii) Bile salts (2mks)

.....

.....

The chemical equation below represent a reaction that occurs in cels.



- (i) Calculate the respiratory quotient (RQ) (2mks)

.....

.....

.....

.....

.....

- (ii) Identify the substrate used in the reaction. (1mk)

.....

Give two reasons why the substrate you have identified in 9. (ii) above is not the
not the main respiratory substrate. (2mks)

.....

.....

.....

Explain what happens in humans when the concentration of glucose in the blood
decreases below normal level. (4mks)

.....

.....

.....

.....

11. State two adaptations of the alveolus to its functions. (2mks)

.....

.....

12. (a) Explain the role of oxygen in Active transport (1mk)

.....

.....

(b) Name two processes that depend on Active transport in animals (2mks)

.....

.....

.....

Name support tissues in plants thickened with:

Cellulose

(1mk)

.....

Lignin

(1mk)

.....

14. State three biological importance of tropisms in plants (3mks)

.....

.....

.....

.....

15. (a) What are Analogous structures? (1mk)

.....

- (b) Give two examples of Homologous structures (2mks)

.....

.....

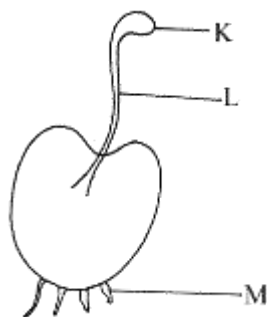
16. State three limitations of fossil records as an evidence of organic evolution (3mks)

.....

.....

.....

Study the diagram below and answer questions that follow



(a) State the division the organism belongs (1mk)

.....

(b) Name the parts labelled K and L (1mk)

K.....

L.....

(c) What is the function of the part labelled M. (1mk)

M.....

Explain the role of the following hormones in reproduction.

Progesterone(2mks)

.....

.....

Oestrogen(2mks)

.....

.....

19. State two factors that hinder self-pollination and fertilization. (2mks)

.....

.....

.....

A mango tree is known as mangifera Indica

- (a) Identify two mistakes made in the writing of the name (2mks)

.....

.....

- (b) What is the scientific naming called? (1mk)

.....

State three methods that could be used to determine the diet of wild animals in an

ecosystem(3mks)

.....

.....

.....

.....

22. State two ways in which chloroplasts are adapted for photosynthesis (2mks)

.....

.....

.....

Name joints formed between the:

- (a) Humerus and scapula (1mk)

.....

(b) Cranial bones (1mk)

.....

State the role of the following chemicals in a test for non-reducing sugar.

(i) Hydrochloric acid (1mk)

.....

(ii) Sodium hydrogen carbonate (1mk)

.....

Name two chemical compounds that are protein in nature that regulate metabolic

activities in the body (2mks)

.....

.....

.....

26. State three environmental factors that increase the rate of transpiration. (3mks)

.....

.....

.....

27. Carbon (II) oxide is a respiratory poison. Explain (3mks)

.....

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PROJECTION NO. 55

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

232/1

BIOLOGY

PAPER I

THEORY

TIME: 2 HOURS

INSTRUCTION TO CANDIDATES

Answer ALL the question

*You are required to spend the first 15 minutes of allowed hours to read the whole paper
carefully before commencing your work.*

Answers must be written in the spaces provided

1. In which part of the cell does respiration occur. (1mk)

.....

.....

2. Distinguish between plasmolysis and Haemolysis. (2mks)

.....

.....

.....

3. Explain the role of water in photosynthesis (2mk)

.....

.....

.....

4. Name two components of Mammalian blood that play a role in blood clotting. (2mks)

.....

.....

.....

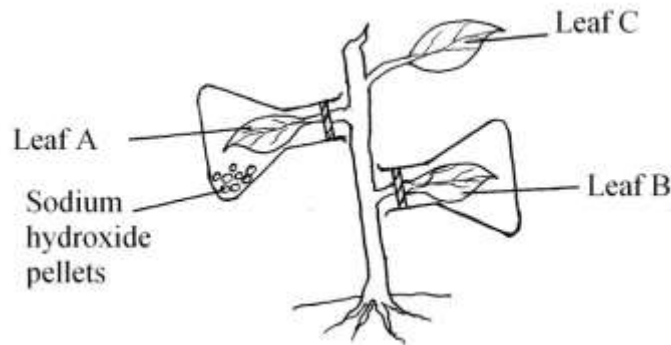
5. Name two similarities between endocrine and nervous system. (2mks)

.....

.....

.....

The diagram below represents an experimental set up to investigate a certain scientific concept.
The potted plant was first destarched by placing it in dark for 48 hours



The set up was then placed in sunlight for five hours. The leaves were then detached and then tested for starch using Iodine solution.

a) What scientific concept was being investigated? (1mk)

.....

b) i) Give the results likely to be obtained after starch test for (2mks)

A,B and C

ii) Account for the results in b(i) above (2mks)

.....

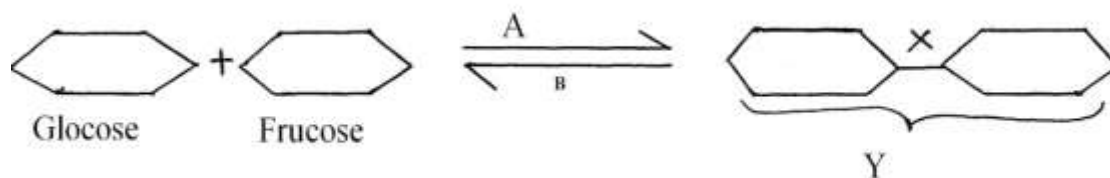
Explain why a pregnant woman excretes less urea compared to a woman who is non-pregnant.(2mks)

.....

.....

.....

Study the reaction below and answer the questions that follow.



i) State the biological process that takes place represented by A (1mk)

.....

.....

ii) What Biological process is represented by B (1mk)

.....

.....

iii) State the product Y (1mk)

.....

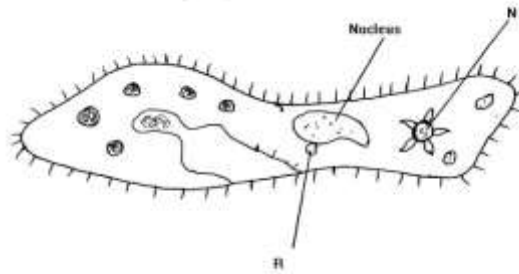
.....

iv) State the bond represented by X (1mk)

.....

.....

The diagram below represents an organism.



State the kingdom to which the organism belongs. Give a reason for your answer.

(2mks)

Kingdom

.....

.....

Reason.

.....

.....

Name the structure labeled

N and R

(2mk)

N

.....

.....

R

.....

.....

10. Explain why water logging favour denitrification in swampy areas (2mks)

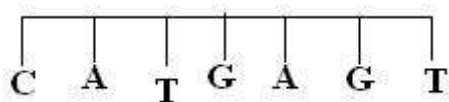
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a) Write the complimentary base sequence of the messenger RNA (mRNA) that would be coded for using the DNA strand shown below

DNA strand

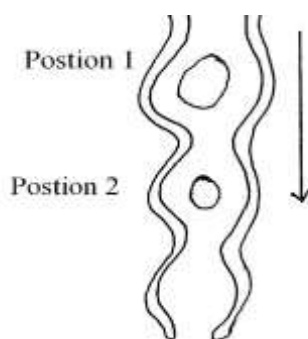


.....

.....

.....

The diagram below show how food bolus moves along the human oesophagus and the intestines.



- a) Identify the process illustrated above (1mk)

.....

.....

Briefly state how the movement of the bolus from position 1 to position 2 is

achieved.(2mks)

.....

.....

13. Name two processes by which flowering plants excrete waste products? (2mks)

.....

.....

.....

Explain how the following structures in.

- i) Hairy leaf (1mk)

.....

.....

- ii) Broad leaf lamina (1mk)

.....

.....

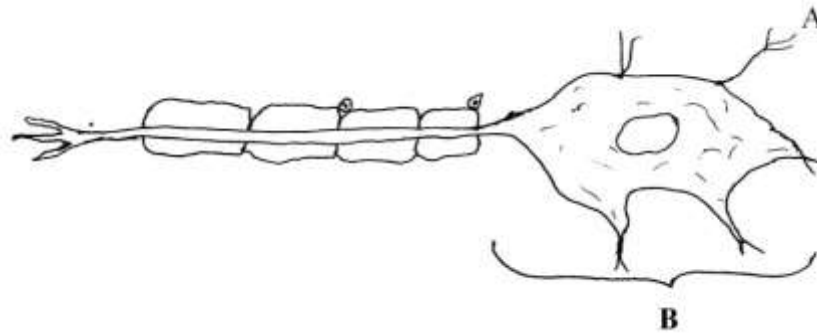
15. a) Name the cartilage found between the bones of the vertebral column. (1mk)

.....

.....

- b) State the function of the cartilage named in (a) above (1mk)

The diagram below represents a sensory neurons.



- a) Name the parts labeled (2mks)

A

.....

B

.....

- b) State two adaptation of a nerve cell to its function (2mks)

Shoots tips are observed to bend and grow towards light coming from one direction unilateral light.

- a) Name the type of response. (1mk)

.....

.....

- b) Explain how the bending towards the source of light occurs. (3mks)

.....

.....

Name two types of fluids formed as as result of ultra filtration process in a mammalian body.

(2mks)

.....

.....

.....

19. The fur of temperate fox turns white in winter. Explain the biological significance of this (1mk)

.....

.....

20. State the structures that make the axial skeleton. (3mks)

.....

.....

.....

Study the diagram below and answer the questions that follow.



- i) What is the identity of the muscle tissue shown. (1mk)

.....

.....

- ii) Where is the tissue found (1mk)

.....

.....

Give one special property of the muscle which is not common to other muscle. (1mk)

.....

.....

22. a) Draw and label the structure of a gill. (3mk)

.....

.....

.....

b) State three adaptation of gills to gaseous exchange (3mks)

.....

.....

.....

When a red eye coloured *Drosophila* fly of unknown heritage is crossed with a double recessive white eyed fly what name is given to such a cross. (1mk)

.....

.....

.....

A girl could clearly read a book placed 10 cm away but could not identify her friend 10 meters away.

a) What eye defect was she suffering from (1mk)

.....

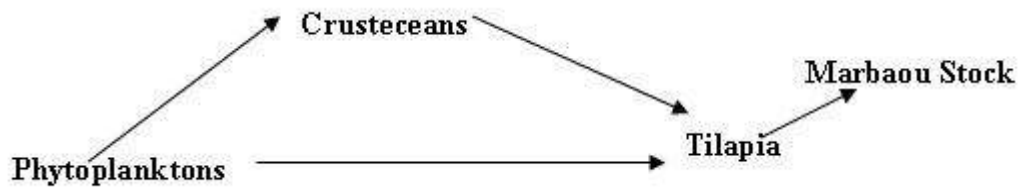
.....

- b) State how the defect can be corrected (1mk)

.....

.....

Below is an illustration of food relationship in a certain ecosystem.



- a) Name the producers (1mk)

.....

.....

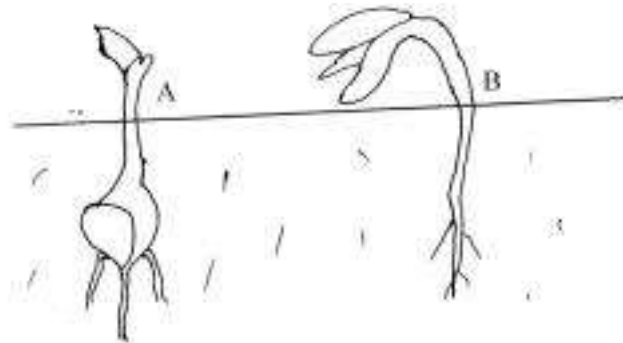
great In which organism would the concentration of pollutants such as heavy metals have a great impact on the life of the organism. Explain your answer. (2mks)

.....

.....

.....

The diagram below represents a stage of growth and development of two different plants.



With reasons identify the type of germination by plant A and B

Plant A:

Reason:

.....

.....

Plant B

Reason

.....

.....

27. Apart from fossil records state two other evidence of organic evolution. (2mks)

.....

.....

.....

28. Explain the biological principle behind the following Malarial control method. (2mks)

Keeping of fish in a pond.

.....

.....

.....

.....

Spraying oil on stagnant water.

.....

.....

.....

a)An epidemic out break may occur as a result of water pollution.

State two source of water pollutants. (2mks)

.....

.....

.....

b) State two ways on how to prevent Bilharzia. (2mks)

.....

.....

.....

30. Name the three gaseous exchange structures in plants. (3mks)

.....

.....

.....

PROJECTION NO. 56

Name..... Index No.....

School..... Sign.....

Date.....

231/1

BIOLOGY

(THEORY)

PAPER 1

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index Number in the spaces provided above.

Sign and write date of examination in the spaces provided above.

Answer **ALL** questions in the spaces provided.

FOR EXAMINER'S USE ONLY.

Question	Maximum score	Candidate score
1-25	80	

This paper consists of 10 Printed pages. Candidates should check the question paper to ensure that all the Papers are printed as indicated and no questions are missing.

1. a) Name the cell organelle which forms spindle fibres during cell division. (1mk)

.....
.....

Other than the function given in (a) above, state one other function of the organelle.

(1mk)

.....
.....

Name the diseases caused by the following parasites.

Salmonella, typhi(1mk)

.....

- ii. Entamoeba histolytica (1mk)

.....

3. a) Name the part of a chloroplast where the following processes occur. (2mks)

i. Photolysis

.....

ii. Carbon (iv) oxide fixation.

.....

- b) State how the part named in a (i) is suited to its function. (1mk)

.....
.....

a)State three pieces of evidence which suggest that organic evolution is ongoing. (3mks)

.....
.....
.....

Giving examples explain what you understand by the following terms as used in evolution. (4mks)

Homologous structures

.....
.....

Analogous structure

.....
.....

a) Give the genetic term used to describe the numbers of chromosomes resulting from

i. Meiosis (1mk)

.....
.....

ii. Non-disjunction (1mk)

.....
.....

Recessive trait is only expressed phenotypically when an organism is

in _____ condition. (1mk)

c) Who postulated the theory that acquired characteristics are

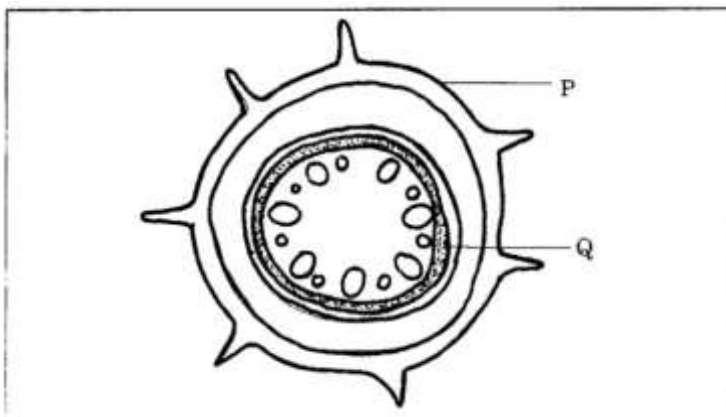
inherited? (1mk)

.....
.....

6. Name two classes of animals that have a cephalothorax. (2mks)

.....
.....

7. The diagram below represents a section through a plant part.



a) (i) Name the part of the plant from which the section was obtained. (1mk)

.....

.....

ii. Give a reason for your answer in a(i) above. (1 mk)

.....

.....

.....

On the diagram, label X to indicate the part which would be stained if the plant was left to stand in coloured waters for 30 minutes before the section was made. (1mk)

.....

.....

.....

c) State the function of the part labeled Q. (1mk)

.....

.....

8. Give one similarity and one difference between water and wind dispersed seeds. (2mks)

.....

.....

.....

.....

(a) Name the parts of a mammalian ear which carry out the following functions.

- i) Balance and posture. (1mk)

.....

.....

.....

- ii) Hearing. (1mk)

.....

.....

- (b) State the importance of presence of glands in auditory canal. (1mk)

.....

.....

10. (a) State the function of co-factors in cell metabolism. (1mk)

.....

.....

- (b) Give one example of a metallic co-factor. (1mk)

.....

.....

11. A form IV student was found having the following symptoms

Bleeding of gums

Poor healing of wounds.

(a) What deficiency disease was the student likely to be suffering from? (1mk)

.....
.....

(c) Suggest the kind of food to be given to rectify the condition. (1mk)

.....
.....

Define the following ecological terms:

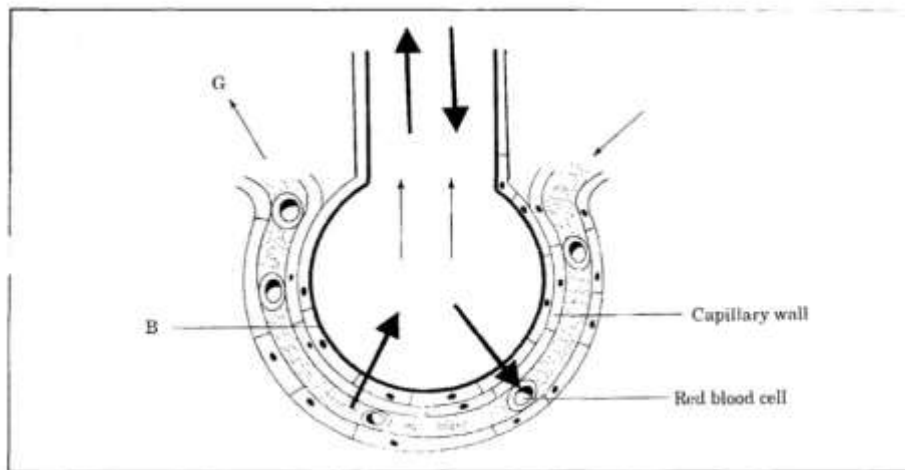
(a) Niche. (1mk)

.....
.....

(b) Ecosystem. (1mk)

.....
.....

13. The diagram illustrates gaseous exchange in alveolus.



(a) Name the feature labeled B. (1mk)

.....
.....

(b) Which blood vessel receives blood leaving at G? (1mk)

.....
.....

(c) (i) How is the capillary wall suited for gaseous exchange? (1mk)

.....
.....

(ii) Name the process by which gases move in and out of red blood cells. (1mk)

.....
.....

For each of the following insect hormones, identify the site of secretion and state the function it serves. (4mks)

(a) Ecdysone;

Site of secretion

.....

Function

.....

Juvenile hormone:

Site of secretion

.....

Function

.....

15. (a) State three differences between light microscope and electron microscope. (3mks)

.....

.....

.....

.....

.....

.....

(c) State two advantages of using low power magnification over high power magnification when viewing specimen under a light microscope. (2mks)

.....

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.....

Name the disease characterized by

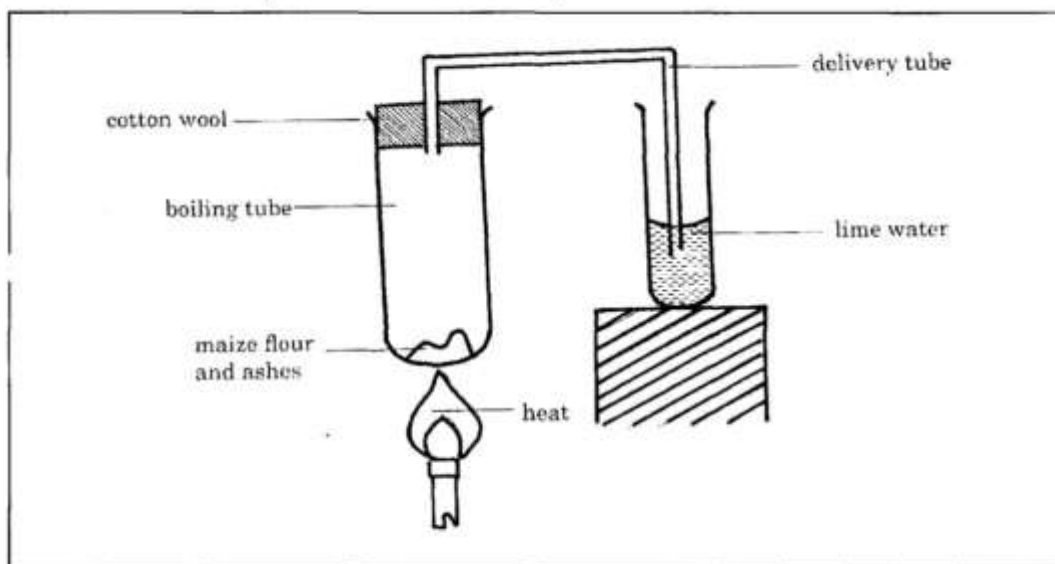
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The diagram below show a set-up to illustrate phenomenon.



(a) State the aim of the experiment.

(1mk)

(b) (i) Identify one error in the set up. (1mk)

.....

.....

(ii) State the expected results if the set up was corrected. (1mk)

.....

.....

(c) What was the use of ash in the experiment? (1mk)

.....

.....

18. State three ways by which human skin protects body tissues. (3mks)

.....

.....

.....

.....

.....

.....

19. (a) Why is blood group AB described as universal recipient? (2mks)

.....

.....

.....

.....

(b) Suggest why blood does not clot in blood vessels of a healthy person. (1mk)

.....

.....

20. (a) State why the placenta is considered as an endocrine gland. (1mk)

.....

.....

(b) Describe how the embryo in human is protected during pregnancy. (2mks)

.....

.....

.....

.....

21. State three effects of dumping untreated sewage into a river. (3mks)

.....

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.....

.....

.....

22. (a) State why people who sweat a lot tend to eat salty food. (1mk)

.....

.....

(b) Explain the effect of salty food on urine production in a person. (3mks)

.....

.....

.....

.....

(a) A person touches a hot object and suddenly withdraws the hand. Using arrows, show how the impulse that leads to withdrawal of the hand travels between the neurons in a reflex arc. (1mk)

.....

.....

(i) Name the response shown when free swimming algae move towards optimum light intensity. (1mk)

.....

.....

(ii) State the biological importance of response shown by algae. (1mk)

.....

.....

(a) Name the plant excretory product which is used for:

i. Treatment of malaria. (1mk)

.....

.....

ii. As a beverage. (1mk)

.....

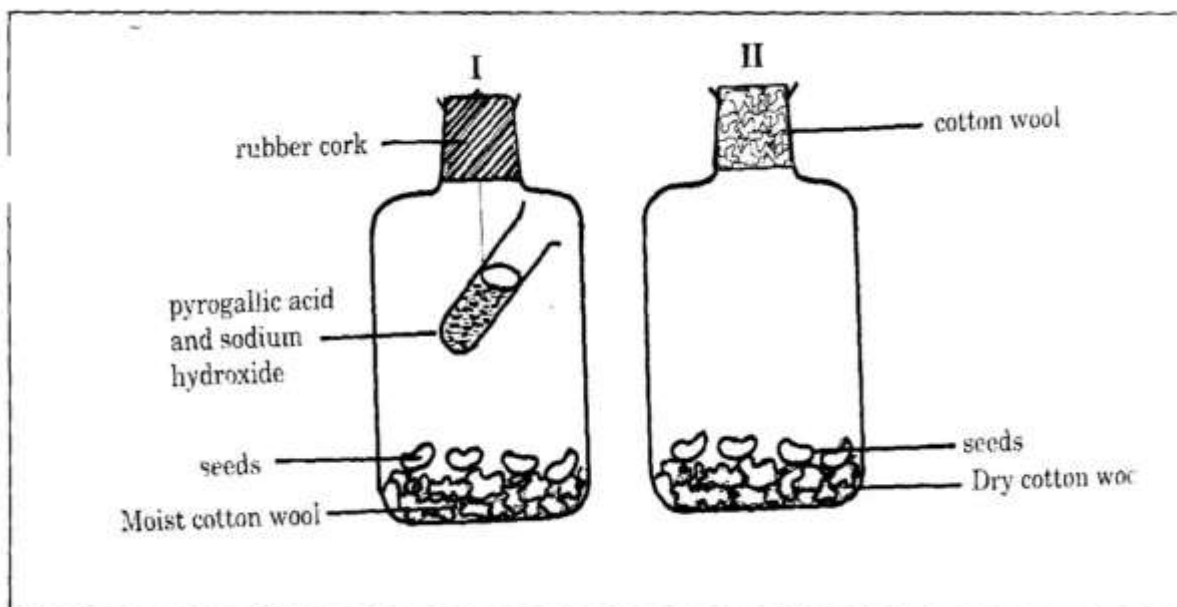
.....

Explain why lactic acid is not considered as an excretory product though it's toxic to tissues. (1mk)

.....

.....

Experiment set ups I and II were used to investigate conditions required in germination. The seeds in the two set ups did not germinate.



Explain why?

i. Seeds in set up I did not germinate.

(2mks)

.....

.....

.....

.....

ii. Cotton wool was placed at the mouth of the flask in set up II. (1mk)

.....

.....

(b) Name the condition which prevented germination in set up II. (1 mk)

.....

.....

.....

.....

PROJECTION NO. 57

NAME..... INDEX NO.....

SCHOOL SIGNATURE..... DATE.....

231/1

BIOLOGY

PAPER 1

2HRS

Kenya Certificate of Secondary Education

231/1

BIOLOGY

PAPER 1

Instructions to candidates;

Write your name and index in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

Answer all questions in the spaces provided .

For examiners only

Question	Maximum score	Candidate scores
1-29	80	

Name the field of science that specializes in the study of chemical changes in an organism.
(1mrk)

.....
.....

2. Explain how light intensity would affect the distribution of fish in a pond. (3mrks)

.....
.....
.....
.....

3. a) **State** the significance of the following in evolution

i) Accumulation of variations in organisms (1mrk)

.....
.....

ii) Survival of the fittest (1mrk)

.....
.....

b) Explain what leads to struggle for existence in organisms exploiting the same
ecological niche (1mrk)

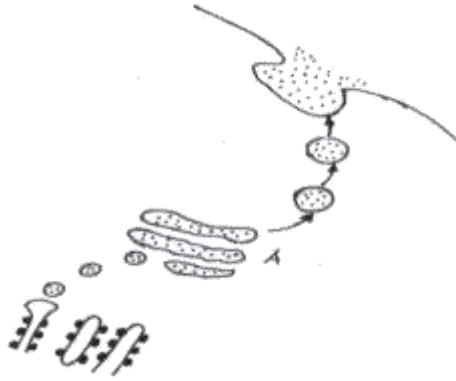
.....
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4. What is the effect of antidiuretic hormone in the human body. (2mrks)

.....
.....
.....

5. **Identify** the organelle marked A. (1mrk)

.....
.....



b) Give **three** functions of the organelle named in (a) above. (3mrks)

.....

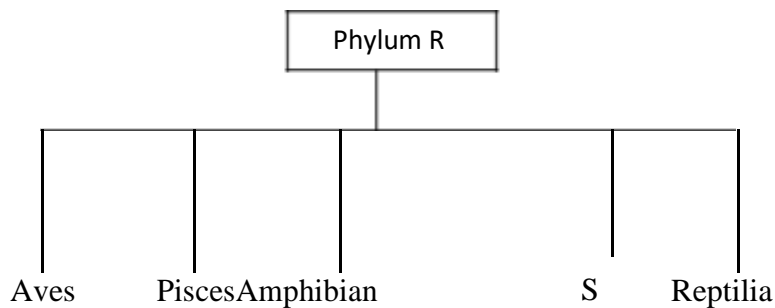
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Study the classification illustrated below and answer the question that follows;



a) Name the phylum R (1mrk)

.....

.....

b) State **two** distinguishing characteristics of member of class S. (2mrks)

.....

.....

.....

The figure below illustrates a portion of a chromosome with genes named A, B, C, S, Q and R.

A	B	C	S	Q	R
---	---	---	---	---	---

Use the diagrams similar to the one above to illustrate the changes if the above chromosome undergoes the following mutations affecting only gene C and S.

- i) Deletion (1mrk)

- ii) Inversion (1mrk)

- iii) Duplication (1mrk)

State the functions of the following in plants.

Poriferous layer

(1mrks)

.....

.....

Pericycle(1mrk)

.....

.....

- ii) Root cap (1mrk)

.....

.....

9. Complete the table below for mineral nutrients in plants. (3mrks)

<i>Mineral nutrients</i>	<i>Function</i>	<i>Deficiency symptom</i>
	Synthesis of proteins and protoplasm	Stunted growth
Calcium		Structural growth and weak
	Formation of part of chlorophyll	Yellowing of leaves

10. a) At what stage of mitosis do chromosomes replicate to form daughter chromatids?

(1mrk)

.....

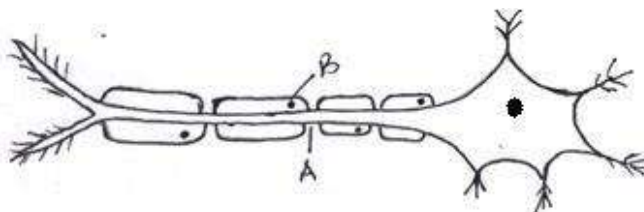
b) A diploid cell was observed to have 46 chromosomes.

i) How many chromatids would the cell produce at the end of meiotic cell division?

(1mrk)

.....

11. The diagram below shows a specialized cell.



a) Name the type of cell shown above. (1mrk)

.....

b) Name the part labeled B. (1mrk)

.....

c) State the function of the part labeled A. (1mrk)

.....

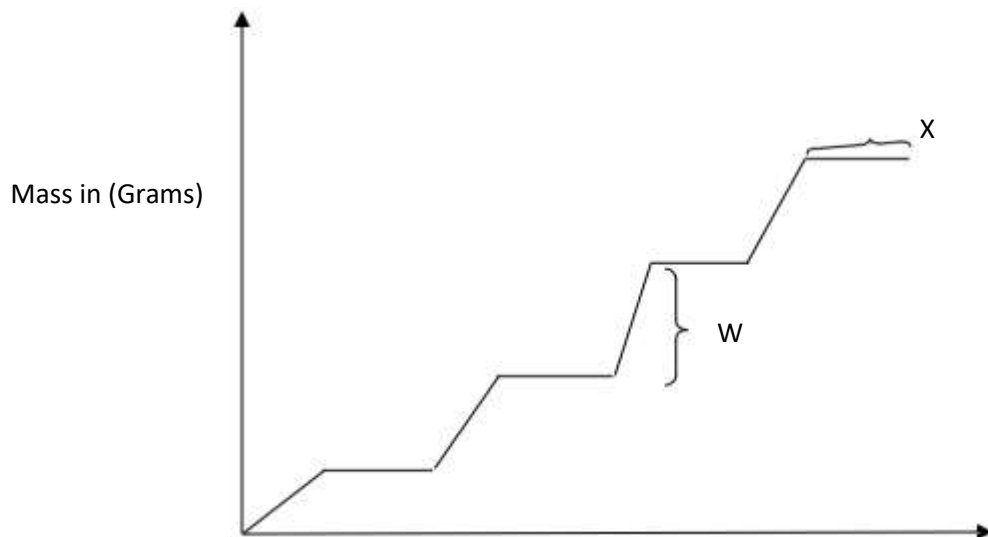
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12. A new born baby has generally a heartbeat of 120 to 140 per minute while that of adult is 70 minutes on average. Account for the difference. (3mrks)

.....

.....
.....
13. What makes young herbaceous plants remain upright? (2mrks)

.....
.....
14. The graph below represents the growth of an animal in a certain phylum.



a) Name the type of growth pattern shown in the graph. (1mrk)

.....
.....
b) Identify the process represented by X. (1mrk)

.....
.....
c) Name the hormone responsible for the process in (b) above. (1mrk)

.....
.....
15. Give two structural differences between smooth muscles and skeletal muscles. (2mrks)

.....
.....
16. Why are people with blood group O called universal donors. (2mrks)

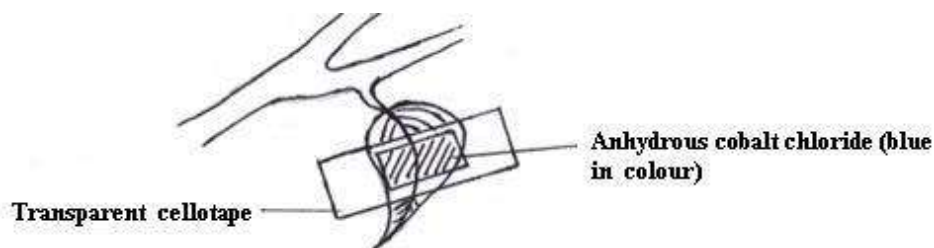
.....
.....
17. Name the site in mammalian lungs where gaseous exchange occurs. (1mrk)

.....
.....
18. Active yeast cells were added to dilute sugar solution in a container. The mixture was left in a warm room. After a few hours bubbles of gases were observed escaping from the mixture.

a) Write an equation to represent the chemical. (1mrk)

.....
.....
b) What is the importance of this type of reaction in industries? (2mrks)

.....
.....
The diagram below shows an experiment done on a leaf of terrestrial plants to investigate a certain biological process in a mesophyte.



a) Explain the expected results (2mrks)

.....
.....
.....
b) What was the use of the cellotape? (1mrk)

.....
.....
.....
State **two** ways in which the ileum is structurally adapted to the absorption of digested food.
(2mrks)

.....
.....
.....
21. a) State the organism that causes the following diseases; (2mrks)

Trichonomiasis

.....
.....
Bilharzia

.....
.....
(b) Name a disease in humans that is caused by **plasmodium falciparum**. (1mrk)

.....
.....
22. Explain how the iris alters the size of the pupil. (2mrks)

Identify the mode of feeding of the

Animal whose dental formula is given below

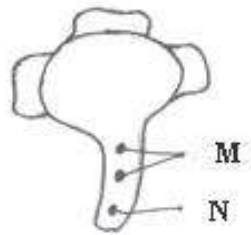
$$I^{0/3} \ C^{0/1} \ Pm^{3/3} \ M^{3/3} = 30 \quad (1\text{mrk})$$

.....
.....

b) Give reasons for your answer in a) (i) above. (2mrk)

.....
.....
.....

24. The diagram below shows a pollen tube as it develops down the style.



a) Name the parts labeled M and N. (2mrks)

M.....
.....

N.....
.....

b) State the functions of the part labeled M. (2mrks)

.....
.....

25. A rainbow lizard was seen basking on a rock

a) **Name two** ways by which it gained heat by these behavioural process. (2mrks)

.....
.....
.....

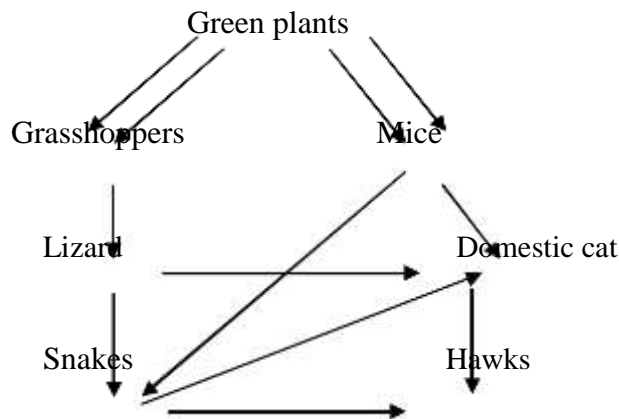
- b) **State** the role of scales in reptiles. (1mrk)

.....
.....

Explain why few organisms are found inhabiting higher altitude than lower altitude.(4mrks)

.....
.....
.....

The chart below shows a feeding in a certain ecosystem.



- a) Construct **two** food chains ending with a tertiary consumer. (2mrks)

.....
.....
.....
.....
.....
.....

- b) Which organisms have the highest variety of predators in the food web. (2mrks)

.....
.....
.....

Suggest **one** way in which the ecosystem would be affected if there was a prolonged drought.(1mrk)

.....
.....

28. A traffic police stretched his arm to the right. To cause this motion of the arm, explain the behavior of his biceps and triceps. (2mrks)

.....

.....

.....

29. Table below shows two mammalian hormones for each hormone. *State* the site of production and its function in the body. (4mrks)

Hormone	Site of production	Function
Oestrogen		
Aldosterone		

PROJECTION NO. 58

Name..... Index No.

School Date.....

Sign.....

231/1

BIOLOGY

PAPER 1

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES

The Paper consists of thirty three (33) Questions

Write your name and index number in the spaces provided above

Sign and write the date of examination in the spaces provided above

Answer ALL the questions in this paper in the spaces provided.

FOR EXAMINERS USE ONLY

QUESTION	Max Score	Candidate Score
1-33	80	

This paper consists of 12 printed pages.

*Candidates should check the question paper to ensure that all pages are printed as indicated
and no questions are missing*

1. a) Name the antigens that determines human blood groups. (2mks)

.....

.....

.....

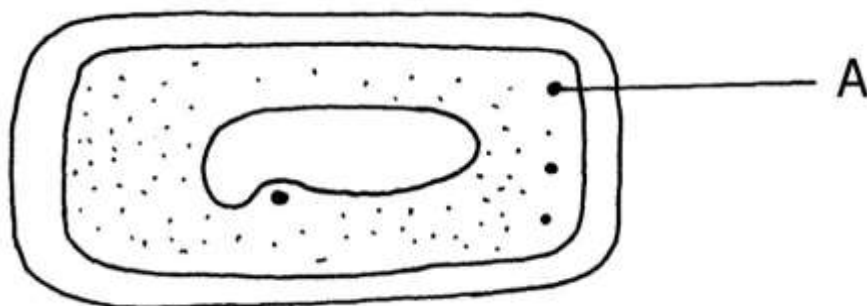
.....

State the adaptation of the red blood cells that make them move in blood capillaries. (1mk)

.....

.....

2. The figure below is a diagram of a cell as seen under the light microscope (3mks)



State three structures that show that these is a plant cell. (3mks)

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3. Why is it more advantageous to breath through the nose than through the mouth. (3mks)

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4. State three characteristics of members of Bryophyta. (3mks)

.....

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State three characteristics of a population
(3mks)

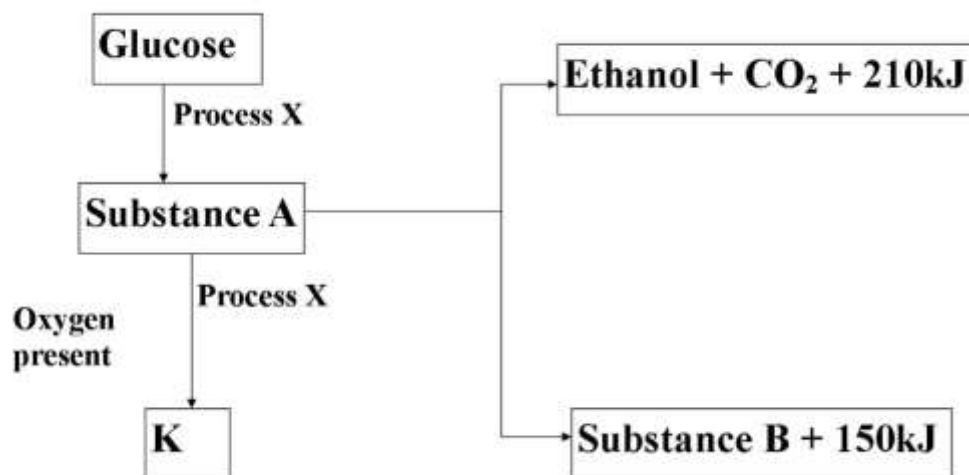
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6. The diagram below represents a simple respiratory pathway in cells (2mks)



- a) Name the process marked X and Y (2mks)

.....

.....

.....

.....

- b) Name substances represented by K. (1mk)

.....

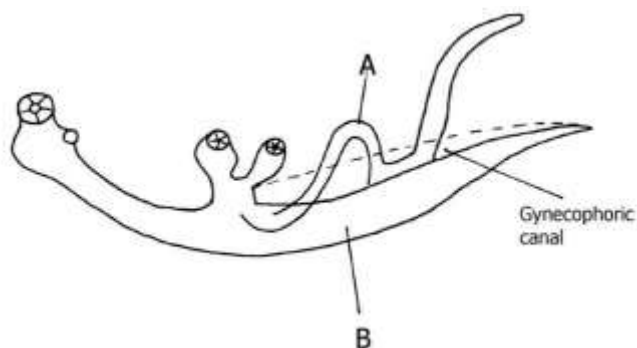
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- c) State the name of substance B. (1mk)

.....

.....

7. The diagram below shows two organisms of the same species (2mks)



- a) State the sex of organism A and B. (2mks)

.....

.....

.....

.....

- b) Name the disease caused by the above organism. (1mk)

.....

.....

Identify the physiological process involved in the following

- a) Feeding in venus fly trap(insectivorous plant) (1mk)

.....

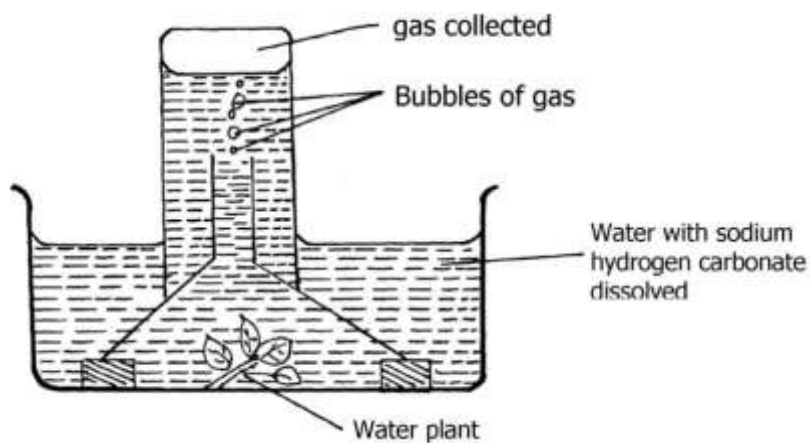
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- b) Absorption of mineral salts by plant roots. (1mk)

.....

9. An experiment on photosynthesis was set up as shown below (4mks)



- a) What was the aim of this experiment. (1mk)

.....

.....

.....

.....

- b) What gas is produced during this experiment. (1mk)

.....

.....

Why was sodium hydrogen carbonate added to water during this experiment. (1mk)

.....

.....

Distinguish between the following

- a) Habitat and ecological niche. (2mks)

.....

.....

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.....

- b) Intraspecific and interspecific competition . (2mks)

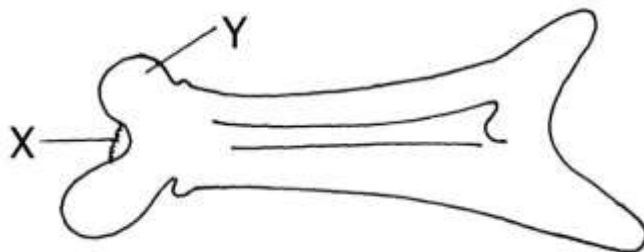
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11. The diagram below represents a mammalian bone. (1mk)



- i) Name the bone (1mk)

.....

.....

.....

ii) Identify the part labelled X

(1mk)

.....

.....

.....

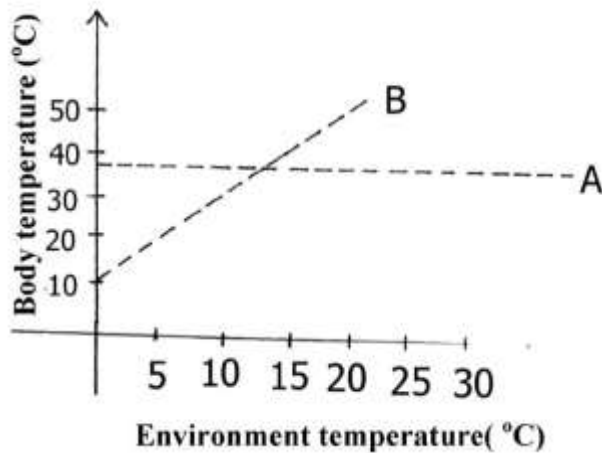
iii) Name the bone that articulates with the part labelled Y

(1mk)

.....

.....

Body temperature of two animals A and B were taken over the increase in environmental temperature. The results are shown in the diagram below.



What name is used to describe group of animals represented by

A.....

(1mk)

B.....

(1mk)

- b) State two advantages of the group of animals represent by A over that of B. (2mks)

.....

.....

.....

13. Briefly explain how the following affect the rate of transpiration (2mks)

- i) Sunken stomata (2mks)

.....

.....

.....

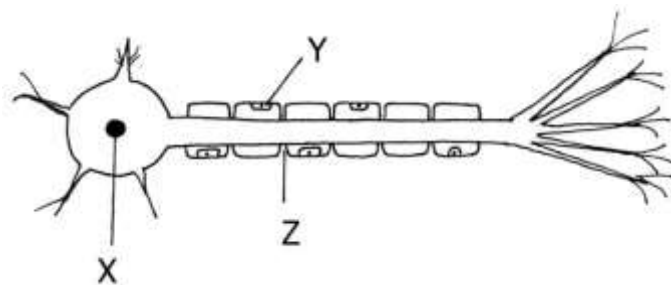
- ii) Hairy leaves (2mks)

.....

.....

.....

The diagram below shows the structure of a neurone



- i) a) Identify the type of neurone drawn above (1mk)

.....

.....

Name the parts labelled X and Y

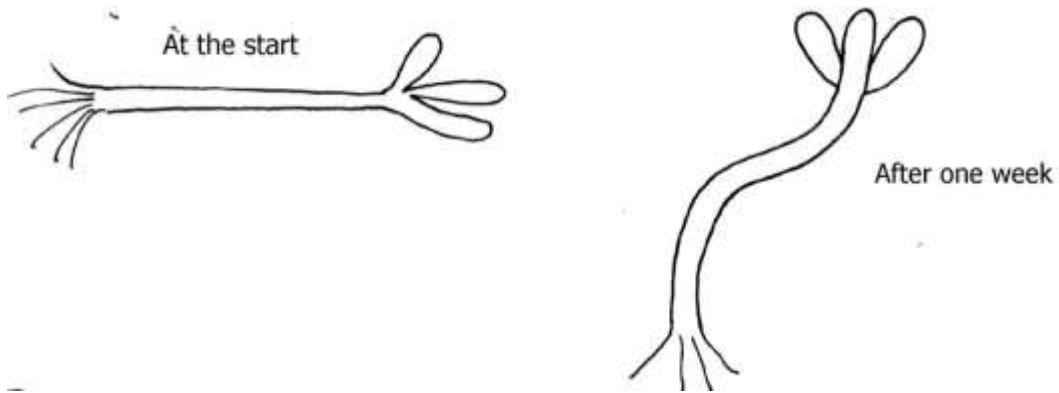
X

.....

Y

.....

A form four girl uprooted a young plant and laid it horizontally on the ground. After one week it was observed that the shoot of the same plant had bend upwards while the root downwards as shown below.



Account for the observations made.

(3mks)

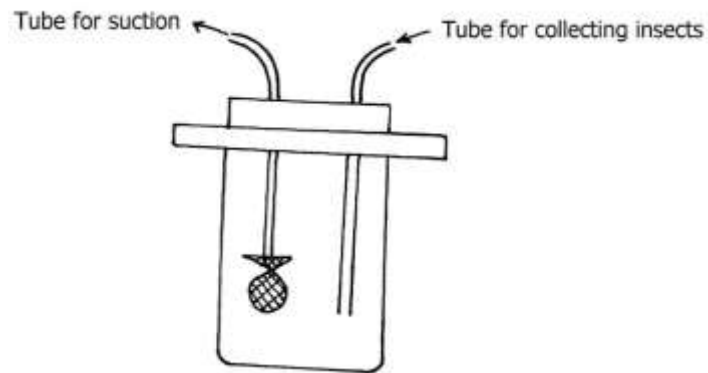
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The diagram below shows on apparatus used in collection of specimen



d) Identify the apparatus (1mk)

.....

.....

d) State its use (1mk)

.....

.....

.....

Give a reason why staining is necessary when preparing specimen for observation under a microscope.(1mk)

.....

.....

The scientific name for a domestic cat is ***felis catus***. Outline the rules that were never followed in writing the name (3mks)

.....

.....

An organelle magnified 6000 times by an electrons microscope, measured 3mm in diameter.

Calculate its real diameter in micro metres.

Show your working

(2mks)

.....

.....

.....

.....

What happens when a young herbaceous plant is well watered with strong salt solution.

(2mks)

.....

.....

.....

.....

21 Name the cell organelles that would be found in abundance in

a) Skeletal muscus

(1mk)

.....

.....

b) Palisade cells

(1mk)

.....

.....

22.State one role of the following elements in the human body.

(1mk)

a) Iron

(1mk)

.....

.....

b) Chlorine (1mk)

.....

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23. a) What is mean by the term assimilation. (1mk)

.....

.....

b) State two ways in which end products of lipids digestion are assimilated. (2mks)

.....

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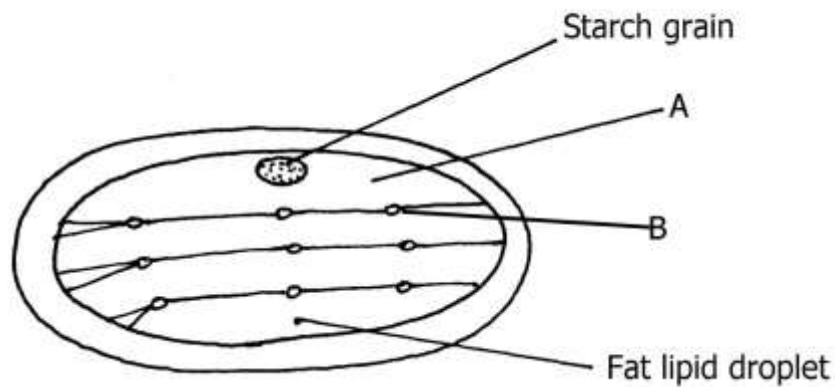
24. Enzyme + substrate \rightleftharpoons enzyme + products

from the above equation name two properties of enzymes exhibited in the equation. (2mks)

.....

.....

25. Study the diagram below and answer the questions that follow (2mks)



What process takes places in A and B. (2mks)

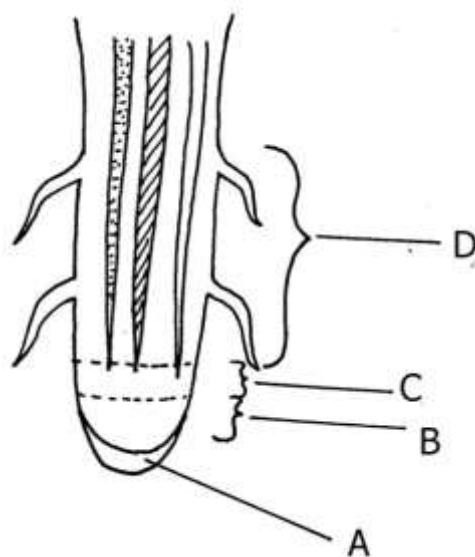
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26. The diagram below represents a section of the dicot root apex. (2mks)



a) State the role of the part marked A (1mk)

.....

.....

b) State three characteristics of the cells found in region B. (3mks)

.....

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.....

27. Give two adaptations of spiracles to their functions. (2mks)

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28. Differentiate between lactic acid fermentation and alcoholic fermentation. (2mks)

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29. State two importance of the placenta during pregnancy (2mks)

.....

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.....

.....

30. State one function of water in a germinating seed. (1mk)

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.....

31. Explain the following terms

a) Test cross (1mk)

.....

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.....

.....

b) Phenotype (1mk)

.....

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.....

Haemophilia is a sex – linked disorder caused by a recessive gene located on the X – chromosome. Give the genotype of a male haemophiliac individual. (1mk)

.....

.....

33. Distinguish between divergent and convergent evolution. (2mks)

.....

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PROJECTION NO. 59

ame..... Index No...../.....

School.....Date

Candidate's Signature.....

231/1

BILOGY

PAPER 1

(THEORY)

Time: 2 Hours

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

Candidates check the question paper to ascertain that all the papers are printed

This paper consists of 8 printed pages.

*Candidates should check the question paper to ascertain that all pages are printed
as indicated and no questions is missing.*

1. Name one factor in nature that increases the process of evolution. (1mk)

.....

.....

2. What is meant by the term "oxygen debt" (2mks)

.....

.....

3. Differentiate between characteristics of membrane of monera and those of protocista (2mks)

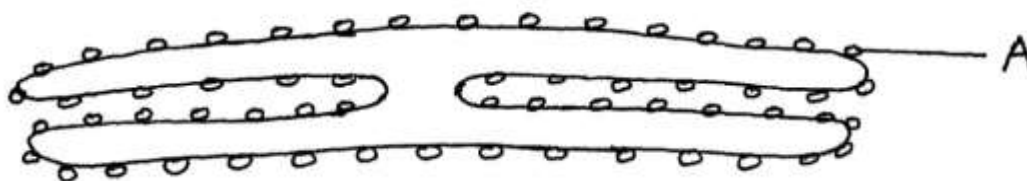
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4.



- (a) Name the organelle drawn above (1mk)

.....

- (b) State function of the structure labeled A (1mk)

.....

5. State two functions of the substance secreted by sebaceous glands. (2mks)

.....

.....

In an experiment, the pituitary gland of a rat was removed.

- (a) State the effect this will have on the quantity of urine produced by the rat. (1mk)

.....

.....

- (b) Give a reason for your answer in (a) above. (2mks)

.....

.....

The lungs and ileum are adapted for absorption .State three features they have in common which facilitate absorption. (3mks)

.....

.....

.....

8. State the function of the diaphragm in the light microscope. (1mk)

.....

.....

9. Explain why food is stored in an insoluble form in the cells of living things. (1mk)

.....

.....

10. Name two components of blood that are not present in the glomerular filtrate. (2mks)

.....

.....

(a) State the importance of the following features in gaseous exchange .

(i) Cartilages in gaseous exchange (1mk)

.....

.....

(ii) Moisture on the surface of alveoli (1mk)

.....

.....

(b) Name two site where gaseous exchange takes place in terrestrial plants. (2mks)

.....

.....

Explain how the following adaptains minimize the rate of transpirations.

(a) Sunken stomata (1mk)

.....

.....

(b) Leaf drooping (1mk)

.....

.....

(c) State two environmental factors that influence the rate of transpiration. (2mks)

.....

.....

13. State the role of decomposition in an ecosystem. (2mks)

.....

.....

An animal is found to have large glomeruli and short loop of Henles .Account for the presence of

(i) Large glomeruli (1mk)

.....
.....

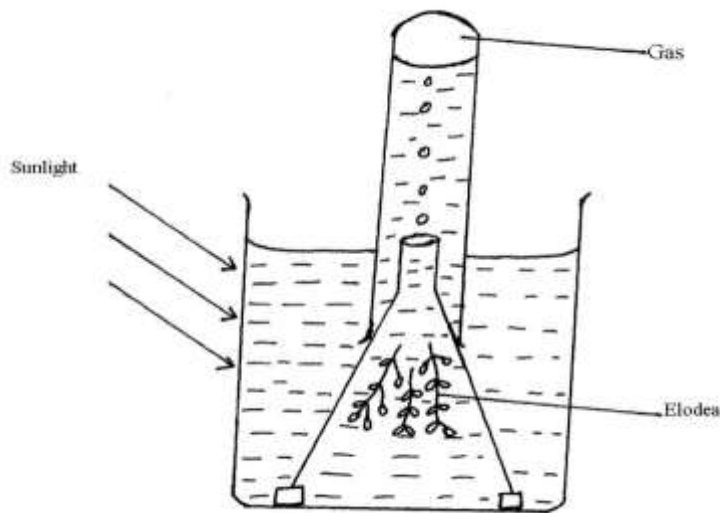
(ii) Short loop of Henle. (1mk)

.....
.....

(iii) State the possible aquatic habitat (1mk)

.....
.....

The diagram below represent a set up that was used to investigate a certain process in a plant.



(a) State the process that was being investigated (1mk)

.....
.....

(b) Name the gas collected in the gas jar (1mk)

.....

(c) State the factor that would affect the process (1mk)

.....

.....

16. Name the sites where light and dark reactions of photosynthesis take place. (2mks)

Light reaction

.....

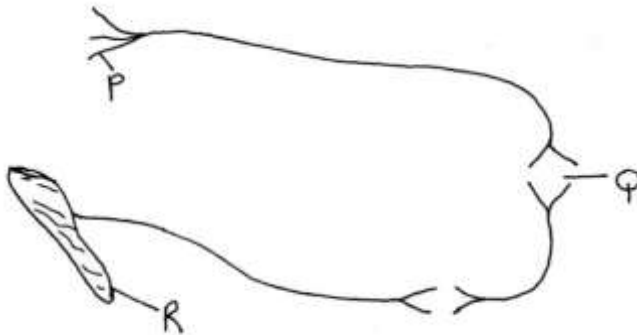
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Dark reaction

.....

.....

The diagram below represents a reflex arc in human beings



(a) Name the parts labeled Q and R . (2mks)

Q

.....

R

.....

(b) What is the function of part labeled P ? (1mk)

.....

.....

(c) Using arrows indicate the direction of impulse transmission on the diagram (1mk)

18. (a) What is the meaning of the following terms (2mks)

(i) Autecology

.....

.....

Synecology

.....

.....

The number and distribution of stomata on three different leaves are shown in the table below.

Leaf	Number of stomata	
	Upper epidermis	Lower epidermis
A	450	0
B	185	270
C	03	15

Suggest the possible habitats of the plants from which the leaves were obtained (3mks)

A

.....

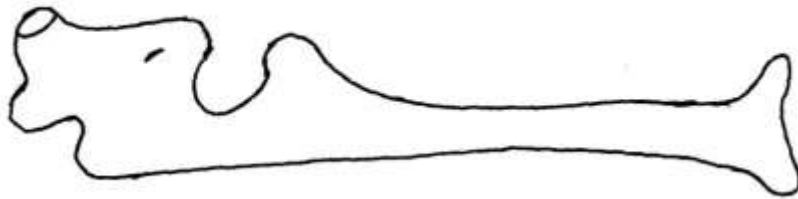
B

.....

C

.....

A bone obtained from a mammal is represented by the diagram below



(a) (i) Name the bone shown above? (1mk)

.....

.....

(ii) State one reason for your answers in (a)(i) above (1mk)

.....

.....

(b) Which bones articulate with bone shown in the diagram above at the notch (1mk)

.....

.....

20. (a) Explain why pepsin in stomach of man is secreted in inactive form. (1mk)

.....

.....

- (b) Which gland secretes pepsinogen. (1mk)

.....

21. Name the regions in plants where the following take place (2mks)

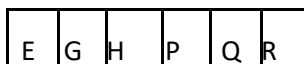
Primary growth

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Secondary growth

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The figure below illustrate a portion of chromosome with genes E,G,H,P,Q and R



Using diagrams similar to the one above, illustrate the changes that the above chromosome would

Undergo .If the following mutations occurred on gene H and P.

- (a) Deletion (1mk)

- (b) Inversion (1mk)

- (c) Duplication (1mk)

23. (a) Name the type of skeleton that arthropods have. (1mk)

.....

.....

(b) What substance is the arthropods skeleton made of? (1mk)

.....

.....

24. In view of modern genetics, explain why Lamarks theory is unacceptable. (2mks)

.....

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.....

25. State two ways in which genetic engineering is applied in the field of medicine. (2mks)

.....

.....

26. What is the functional difference between a tendon and ligament. (1mk)

.....

.....

27. (a) How is fovea centrails adapted for its function in the human eye. (2mks)

.....

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A person was not able to see far objects clearly but could not view near objects

clearly. Name the eye – defect the person had. (1mk)

.....

.....

.....

(1mk)

(2mks)

(3mks)

Osmosis	Active transport

(2mks)

(2mks)

.....

.....

31. State two features of petals that enhances insect pollination. (2mks)

.....

.....

.....

32. How are halophytes adapted for survival in their habitats. (2mks)

.....

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END

PROJECTION NO. 60

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

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SIGN:.....

231/1

BIOLOGY

PAPER I

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and Index number in the spaces provided.

Answer ALL questions in the spaces provided.

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1–30	80	

This paper consists of 8 printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

Answer all the questions in the spaces provided

1. State two feature common in mammals and bird (2 marks)

.....

.....

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2. Name the causal organism of the following diseases in humans; (2 marks)

a) Bilharzi

.....

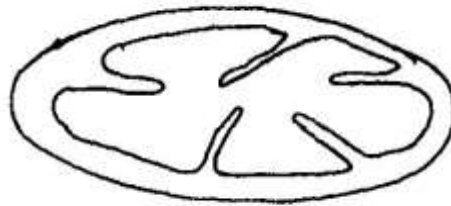
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Syphilis

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.....

3. i) Identify the organelle shown below (1 mark)



.....

.....

How is the organelle you have identified in a(1) above suited to its function

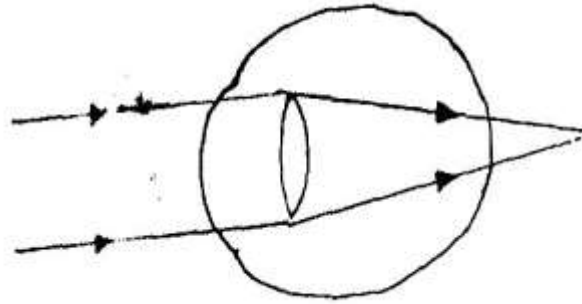
(2 marks)

.....

.....

.....

4 Use the diagram below to answer the questions that follow



i) Name the eye defect represented above (1 mark)

.....

.....

ii) What is the cause of this defect (1 mark)

.....

.....

iii) How can the defect you have named (a) (i) be corrected? (1 mark)

.....

.....

.....

5.Name the components of the blood that do not enter the renal tubule in mammals. (2 marks)

.....

.....

.....

6. Give two factors affecting the rate of respiration. (2 marks)

.....

.....

.....

7. State three structural differences between muscles alimentary canal and biceps muscles.

(3 marks)

.....

.....

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.....

.....

8. a) Name the micro-organism found in the root nodules of legumes (1 mark)

.....

.....

.....

b) State the association of the micro-organisms named in (a) above (1 mark)

.....

.....

.....

c) What is the role of the micro-organism you named in (a) above. (1 mark)

.....

.....

.....

a) Name the stage in mitosis where chromatids collect together at the two opposite ends of the spindle fibres. (1 mark)

.....

.....

.....

b) State two functions of centrioles (2 marks)

.....

.....

.....

10. a) State two functions of large intestines in man. (2 marks)

.....

.....

.....

Name the disease caused by lack of each of the following in human diet. (3 marks)

Vitamin D

.....

.....

Iodine

.....

.....

Iron

.....

.....

a) In a blood test, a few drops of anti-B serum were added to two samples of blood. It was noted that agglutination occurred. What were the possible blood groups of the two blood samples? (2 marks)

.....

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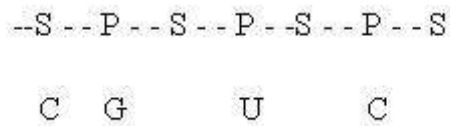
b) Why would carboxyhaemoglobin lead to death? (2 marks)

.....

.....

.....

The figure below is a structural diagram of a portion from a nucleic acid strand.



a) Giving a reason, name the nucleic acid to which the portion belongs. (2 marks)

Name

.....

.....

Reason

.....

.....

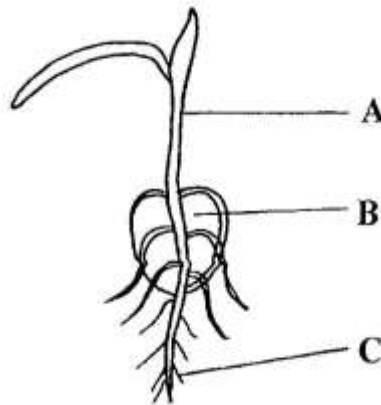
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b) Write down the sequence of bases of a complimentary strand to that (1 mark)

.....

.....

The diagram below represents a maize seedling.



Name the structure labeled A and C (2mks)

A

.....

.....

C

.....

.....

b) i) State the functions of parts labeled B and C (2 marks)

B

.....

.....

.....

C

.....

.....

.....

ii) Name the type of germination exhibited by maize. (1 mark)

.....

.....

14. What is meant by the following terms? (2 marks)

Carbon (IV) oxide fixation

.....

.....

.....

Compensation point

.....

.....

.....

a) State two ways in which floating leaves of aquatic plants are adapted to gaseous exchange (2 marks)

.....

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.....

- b) Name two structures for gaseous exchange in aquatic plant. (2 marks)

.....

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Outline three roles of active transport in the human body.

.....

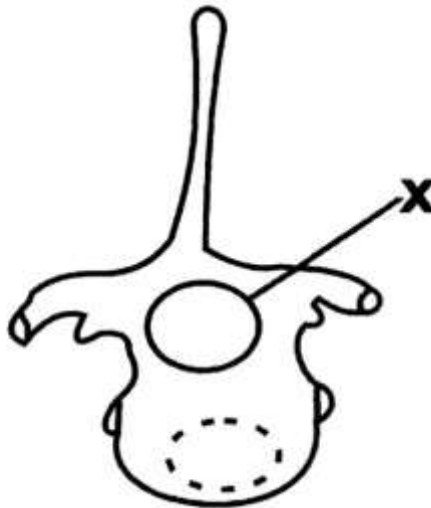
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The diagram below shows a bone from a mammal.



- a) Name the structure that passes through part labeled X. (1 mark)

.....

.....

- b) What function does the vertebra provide for structure X (1 mark)

.....

.....

In which region of the vertebral column is:

i) The bone found? (1 mark)

.....

.....

ii) Give a reason for your answer in c (i) above. (1 mark)

.....

.....

18. a) Explain how the following parts of a mammalian reproductive system are adapted to their functions. (2 marks)

Testis

.....

.....

.....

Uterus

.....

.....

.....

Explain why removal of the ovary after four months of pregnancy does not terminate pregnancy.

.....

.....

.....

State the role of the following hormones in homeostasis

i) Antidiuratic hormone (vasopressin) (1 mark)

.....

.....

.....

ii) Aldosterone hormone (1 mark)

.....

.....

.....

20. Distinguish between plasmolysis and haemolysis (2 marks)

.....

.....

.....

21 . Give two reasons why pressure of blood is greater in arteries than in the veins of mammals. (2 marks)

.....

.....

.....

a)What is meant by

i) Autecology (1 mark)

.....

.....

.....

ii) Synecology (1 mark)

.....

.....

.....

An organelle was magnified 800 times by an electron microscope. Its diameter was 2 millimetres.

Calculate the actual diameter in micrometres. (2 marks)

24. Give two advantages of natural selection to organisms. (2 marks)

.....

.....

.....

.....

25. a) State two ways in which some fungi are harmful to man (2 marks)

.....

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.....

c) List the main characteristics that are used to sub- divide arthropods into classes (2 marks)

.....

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27. Euglena is positively phototactic. Of what biological significance is this characteristics (1 mark)

.....

.....

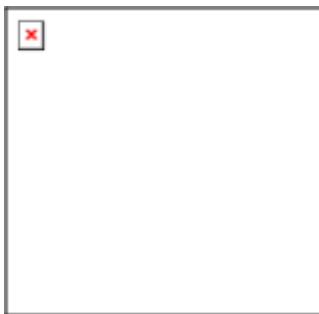
27. What is the role of the vascular bundles in plant nutrition? (3 marks)

.....

.....

.....

Study the diagram below which shows part of a mammalian tooth and answer the questions that follow



a) With a reason, identify the tooth (2 marks)

Identity

.....

.....

Reason

b) State one adaptation of the tooth to its function (1 mark)

.....

.....

.....

29. a) What is co-dominance? (1 mark)

.....

.....

.....

Name two disorders in human blood that are caused by gene mutation. (2 marks)

.....

.....

.....

Plants relatively have less waste to excrete than animals. Giving two reasons to explain this

Observation. (2 marks)

.....

.....

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PROJECTION NO. 61

Name..... Index No.....

School..... Candidate's sign.....

Date.....

231/1

BIOLOGY

Paper 1

2 Hours

INSTRUCTIONS TO CANDIDATES.

Answer all the questions in the space provided

For examiners use only:

Questions	Max score	Candidates
1-27	80	

This paper consists of 2 printed pages. Candidates should check the question paper to

Ensure that all the pages are printed as indicated and no questions are missing.

State the function of the following cell organelle

Ribosome(3mks)

.....

.....

Smooth endoplasmic reticulum

.....

.....

Golgi apparatus

.....

.....

2. List any distinguishing features of the class arachnida (2mks)

.....

.....

3. (a) (i) Name the hormone responsible for moulting in insects (1mk)

.....

Where is the hormone in a(i) above secreted

.....

.....

- (b) State the role of juvenile hormone in the development of insect (1mk)

.....

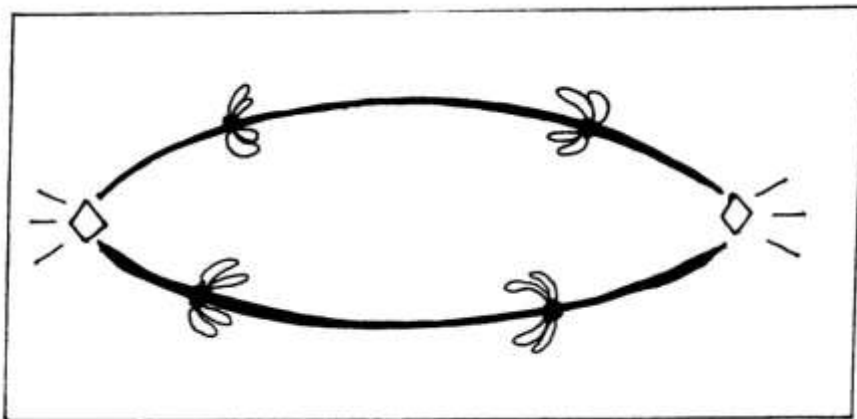
4. State three functions of the mammalian blood other than transport (3mks)

.....

.....

.....

Below is a stage in cell division



(a) Identify the stage (1mk)

.....

(b) Give reasons for your answer (2mks)

.....

.....

Industrial wastes may contain metallic pollutants. State how such pollutants may indirectly reach and accumulate in the human body if the wastes were dumped into rivers. (3mks)

.....

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.....

Name parts of the brain which control

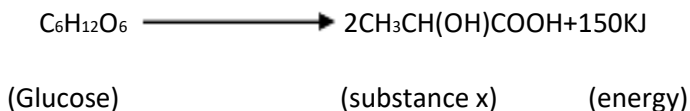
(a) Involuntary activities e.g breathing (1mk)

.....

- (b) Control voluntary body movement (1mk)

.....

During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles



- (a) What is the name of this process (1mk)

.....

- (b) Name the substance X (1mk)

.....

- (c) What happens to the muscle if x accumulates to critical level (1mks)

.....

9. (a) What is meant by (a) organic evolution (1mk)

.....

.....

- (b) Adaptive radiation (1mk)

.....

.....

Identify the type of mutation represented by the following pairs of words

- (i) Shirt instead of skirt (1mk)

.....

- (ii) Hopping instead of shopping (1mk)

.....

(iii) Eat instead of tea (1mk)

.....

State the function of the following in reproduction

(a) Umbilical cord (3mks)

.....

.....

Aerosome

.....

.....

Follicle stimulating hormone

.....

.....

(a) Explain why a person discharges urine more frequently when environment temperatures are low than when they are high. (2mks)

.....

.....

.....

(b) Name the nitrogenous wastes excreted by a fresh water fish (1mk)

.....

Explain why individuals with smaller sizes requires more energy per kg of body weight than those with large sizes (3mks)

.....

.....

.....

14. List three types of muscles (3mks)

.....

.....

.....

Describe the path taken by carbon (iv) oxide released from the tissues of a cockroach into the atmosphere(3mks)

.....

.....

.....

16. Name the blood vessels that transport blood from (3mks)

Small intestines to the liver.....

Heart to the kidney.....

Heart to the lungs.....

The number and distribution of stomata on three different leaves are shown in the table below

Leaf	Number of stomata	
	Upper epidermis	Lower epidermis
A	300	0
B	150	200
C	02	13

Suggest the possible habitat of the plant from which the leaves were obtained

Leaves

Habitat

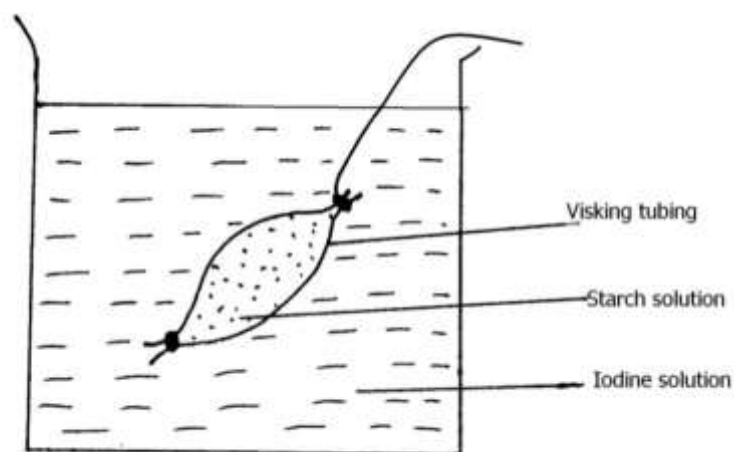
A

B

(b) State one modification found in the stomata of leaf C (1mk)

.....

18.



The set-up above was prepared by form one students and left for 1 hour

They made the following observations

	At the start	After one hour
In visking tubing	White solution	Blue-black
In beaker	brown	brown

(a) Identify the physiological process being investigated (1mk)

.....

(b) Explain the observation made (3mks)

.....

.....

.....

.....

In a field study a student came across a plant whose leaves quickly folded when touched, he gave the name as Mimosa Pudica

(a) Identify the mistake he made when writing the scientific name (2mks)

.....

(b) Name the type of response (1mk)

.....

(c) State the possible advantage of this response to the plant. (1mk)

.....

20.State three characteristics features of an efficient respiratory surface (3mks)

.....

.....

.....

21. State three environmental factors that affect the rate of stomatal transpiration (3mks)

.....

.....

.....

22. (a) What is the importance of Adenosine triphosphate (ATP) in mammals (1mk)

.....

(b) State two functions of respiratory Quotient (RQ) (2mks)

.....

.....

23. Give two functions of the exoskeleton in insects (2mks)

.....

.....

24. State four ways of breaking seed dormancy (4mks)

.....

.....

.....

.....

.....

25. Other than sexual intercourse name the other ways by which HIV/AIDS is spread (3mks)

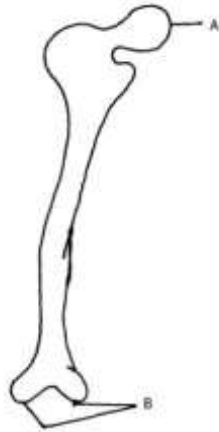
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.....

The diagram below represents a bone in a mammal



- (a) Identify the bone (1mk)

.....

- (b) Name the bone that articulate with the above bone at part A (1mk)

.....

- (c) Name the joint formed at the part labeled B (3mks)

.....

.....

.....

An animal has the following dental formula,

$1=0/2$ $C=0/2$ $pm\ 3/3$ $m=2/3$

- (a) Suggest the type of diet for this animal (1mk)

.....

- (b) Give a reason for your answer in (a) above (1mk)

.....

- (c) How many teeth does the animal have in total (1mk)

.....

PROJECTION NO. 62

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

.

SIGN:.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided at the top of this page.

Sign and write the date of examination in the spaces provided above.

Answer all the questions.

Answers must be written in the spaces provided in the question paper.

Additional pages must not be inserted.

This paper consists of 12 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

FOR EXAMINERS USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE

This paper consists of 8 printed pages.

Candidates should check the question paper to ensure that all pages are printed as indicated and that no questions are missing.

1. Name the causative agent of the following diseases in man (2mks)

candidansis

.....

Syphilis

.....

A student observed an organelle using an electron microscope at magnification of X600. Its diameter has 2 millimeters. Calculate the actual diameter of the organelle in micrometer (2mks)

3. State two ways by which lactic acid formed in the muscles of an athlete is removed (2mks)

.....

.....

4. (a) Name the blood vessels that connect arteries to veins (1mk)

.....

Explain three ways in which the vessels named in (a) above are adapted to carry out their function. (3mks)

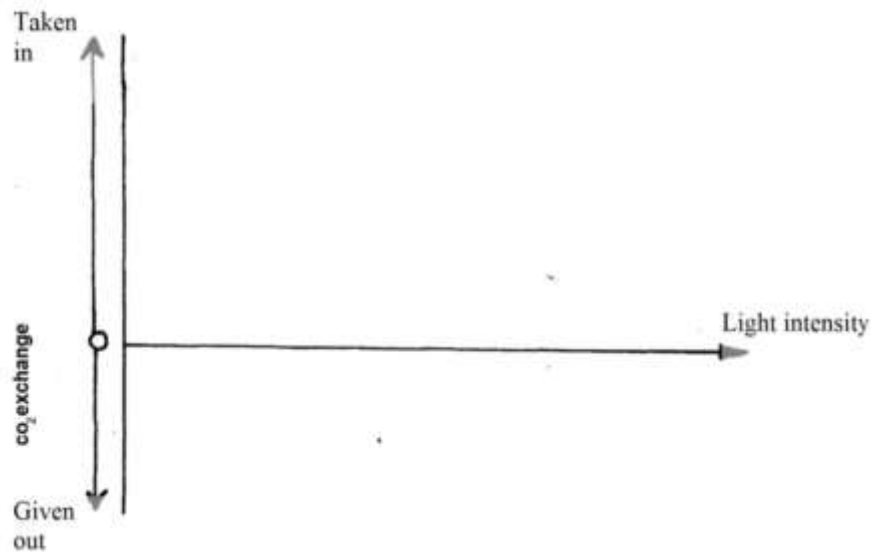
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.....

The figure below shows the effect of light intensity on the exchange of carbon (IV) oxide between a plant leaf and the atmospheric air.



(a) What name is given to point X? (1mk)

.....

.....

Name two physiological processes in which carbon (IV) oxide is involved at point X

(2mks)

.....

.....

6. State where each of the following is found in the human skeleton (2mks)

(a) Olecranon

.....

(b) Glenoid cavity

.....

Explain why people living at high altitude have higher concentration of red blood cells and haemoglobin than people who live at lower altitude (2mks)

.....

.....

.....

.....

State the survival value of ;

(a) Negative phototaxis in fly larvae (2mks)

.....

(b) Thigmotropism (1mk)

.....

Using the symbol 'B' for black for allele in mice and 'D' for grey coloured for allele, write down the genotype of a mouse that is:

Heterozygous for color

.....

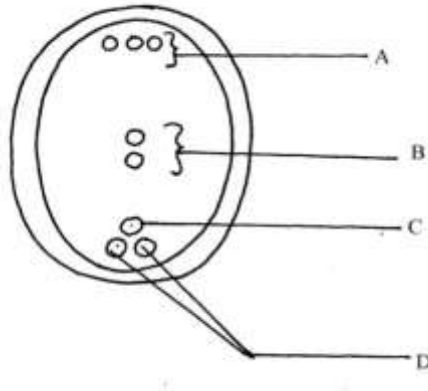
.....

Homozygous recessive

.....

.....

The diagram below shows a mature embryo sac of a flowering plant



(a) Name the parts labelled (3mks)

A.....

D.....

(b) What is the function of structures labelled B? (1mk)

.....

(a) State two ways in which the human body is naturally protected against harmful bacteria (2mks)

.....

.....

State one way in which the composition of blood in the pulmonary artery and that in pulmonary vein (1mk)

.....

Describe how the following parts of the mammalian ear are adapted to their functions

Pinna

.....

.....

Tympanic membrane

.....

.....

13. State the necessity of support in plants (3mks)

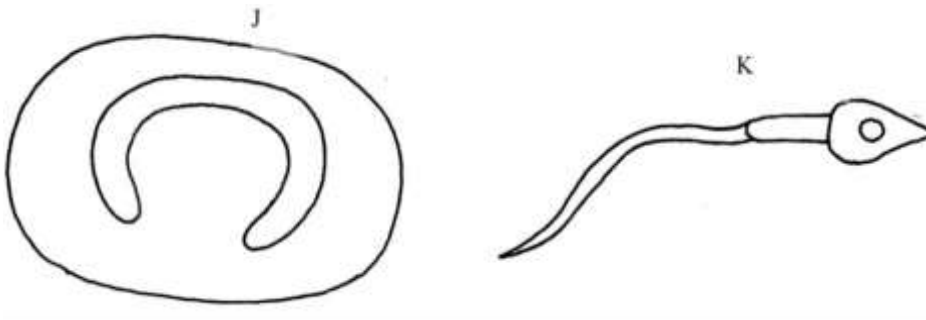
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.....

Below are diagrams of specialised cells in mammals



(a) Identify each of the cells (2mks)

J.....

K.....

(b) Explain how cell specialization has enabled cell K to be effective in its functions (2mks)

.....

.....

15. (a) State one similarity between diffusion and osmosis (1mk)

.....

.....

(b) State two roles of active transport in higher plants (2mks)

.....

.....

(a) A light microscope is an important apparatus in a laboratory. State two precautions which

should be taken when storing (2mks)

.....

.....

(b) State functions of the following parts on a microscope (2mks)

Fine adjustment knob

.....

.....

Condenser

.....

.....

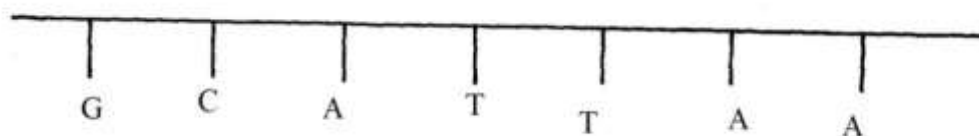
17. (a) Name the hormone responsible for moulting in insect (1mk)

.....

- (b) Where is the hormone named in (a) above secreted in insects (1mk)

.....

The figure below represents a section of a certain nucleic acid



- (a) (i) Identify the type of nucleic acid from which this strand was obtained. (1mk)

.....

- (ii) Give a reason for your answer in a (i) above (1mk)

.....

.....

- (b) State two structural differences between the RNA and DNA (2mks)

.....

.....

What assumptions are made while using capture and recapture method in estimating population(2mks)

.....

.....

.....

.....

A count for osmoregulatory changes that would take place in a marine amoeba if it was transferred to a fresh water environment (3mks)

.....

.....

.....

.....

.....

21. (a) What is metamorphosis (1mk)

.....

.....

(b) What is the biological importance of the larval stage during metamorphosis (2mks)

.....

.....

A solution of sugar cane was boiled with dilute hydrochloric acid. Sodium hydrogen carbonate was added and then heated with Benedicts' solution .An orange precipitate was formed

(a) Why was the solution boiled with dilute hydrochloric acid (2mks)

.....

.....

.....

.....

(b) To which class of carbohydrates does sugar cane belong? (1mk)

.....

23. (a) What is organic evolution (1mk)

.....

.....

(b) State two ways through which fossils serve as evidence for organic evolution (2mks)

.....

.....

(a) State the advantage of desert animals excreting their nitrogenous waste in form of urea and not ammonia (3mks)

.....

.....

.....

.....

.....

.....

(b) State two modifications on the kidney nephron of desert mammals (2mks)

.....

.....

Consider the characteristics of the following organisms: bee, tick, lobster, cockroach, millipede, moth and mosquito.

(a) Give the name of the phylum to which all these organisms belong. (1mk)

.....

(b) State three distinctive features of members of the phylum named in (a) above (3mks)

.....

.....

.....

26. Explain how the following lower the rate of transpiration in plants (2mks)

Hairs on the leaf

.....

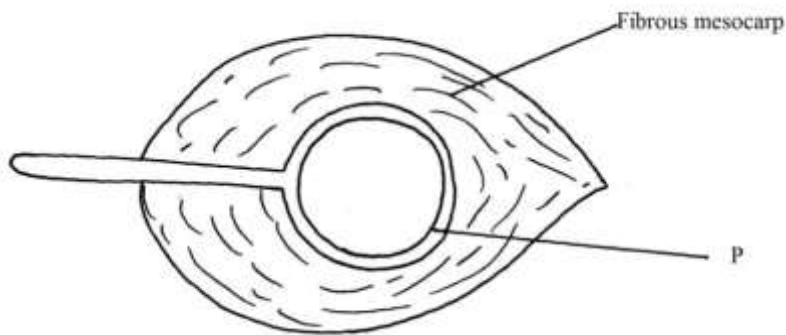
.....

Folding of the leaf

.....

.....

The diagram below represents a longitudinal section of a fruit



(a) Name structures labelled P (1mk)

.....

(b) Describe two adaptations of the fruit for its mode of dispersal (3mks)

Mode of dispersal

.....

.....

.....

.....

Adaptation

.....

.....

PROJECTION NO. 63

NAME:ADM NO:

SCHOOL:STREAM:

INDEX NO:

231/1
BIOLOGY
Paper 1
2 HOURS

Instructions to candidates

Write your name, school and index number in the spaces provided

Answer all questions in the spaces provided

For Examiner's use only

Question	Maximum Score	Candidate's Score
1-29	80	

1. Define the following branches of Biology. (2 marks)
- Genetics

.....

.....

Entomology

.....

.....

State three reasons that necessitate classification of living organisms by taxonomists. (3 marks)

.....

.....

.....

.....

.....

3. Define resolving power of a microscope. (1 mark)

.....

.....

State two functions played by the cell wall in plant cells and give the adaptation of the cell wall to performing each of the stated functions. (4 marks)

Function	Adaptation
i)	
ii)	

The cells of a certain herbaceous plant were found to have a diameter of 25µm. The cells were placed in varying concentrations of sugar solution. The average diameter of the cells in each solution was determined and the results obtained were as shown in the table below.

Concentration of sugar solution (%)	Diameter of cells (µm)
1	50
5	40
10	30
15	20

- a) From the results determine the concentration of the cell sap. (1 mark)

.....

Give an explanation for the average diameter of the cells placed in 15% sugar solution (3 marks)

.....

- c) Name the process that occurred in the cells which were placed in 1% sugar solution. (1 mark)

.....

6. (a) Name two defects of the circulatory system in humans. (2 marks)

.....

(b) State three functions of blood other than transport. (3 marks)

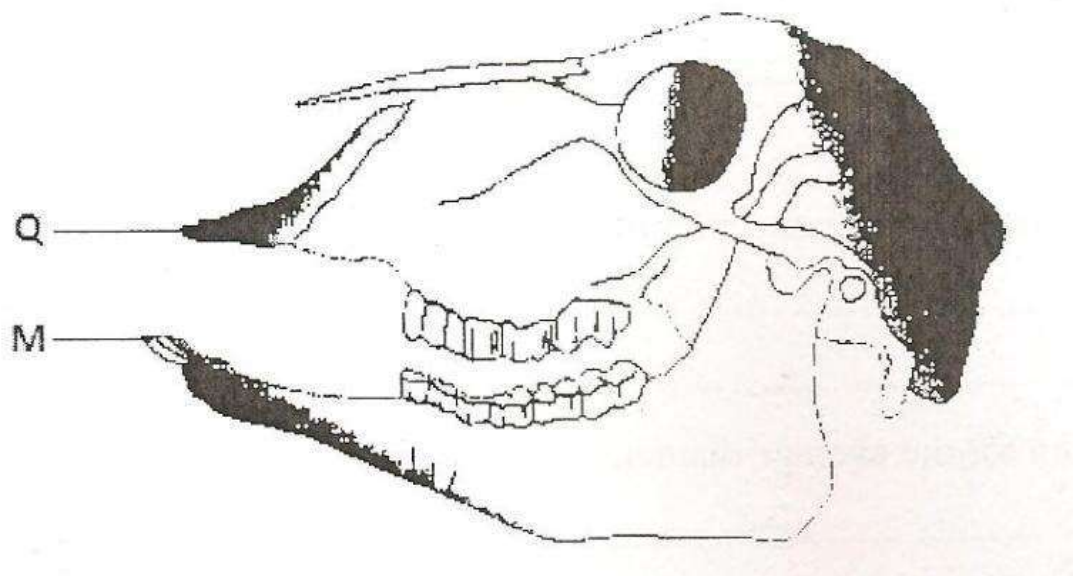
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.....

The following specimens were extracted from a newly discovered organism.



a) Name the tooth labeled M. (1 mark)

.....

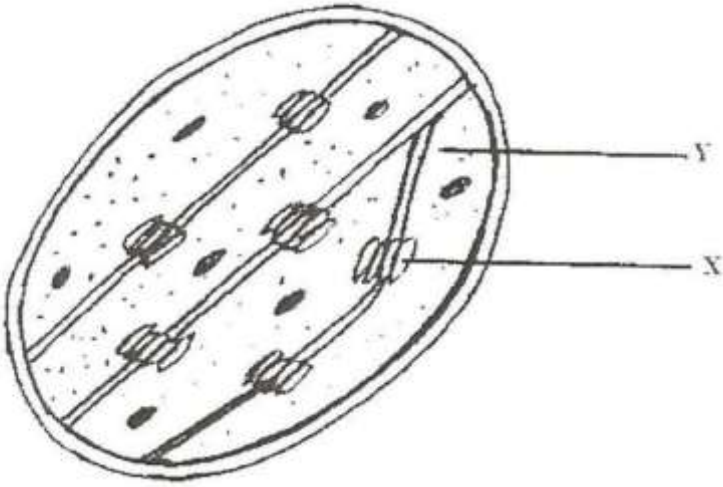
.....

b) Name the part labeled Q and state its role. (2 marks)

Name:

Role:

The diagram below represents a cell organelle



a) Name the part labeled Y (1 mark)

.....

b) State the function of the part labeled X (1 mark)

.....

.....

9. (a) In what form is energy stored in muscles? (1 mark)

.....

.....

(b) State the economic importance of anaerobic respiration in plants. (2 marks)

.....

.....

.....

.....

10. (a) Name two gaseous exchange surfaces in plants. (2 marks)

.....

.....

How are gaseous exchange surfaces in animals adapted to performing their function? (2 marks)

.....

.....

.....

.....

11. What is the importance of counter flow system in fish? (2 marks)

.....

.....

.....

.....

State two structural modifications of the kidneys of desert animals like the kangaroo rat. (2 marks)

.....

.....

.....

.....

13. (a) Name the fluid that is produced by sebaceous glands. (1 mark)

.....

.....

(b) What is the role of sweat on the human skin? (2 marks)

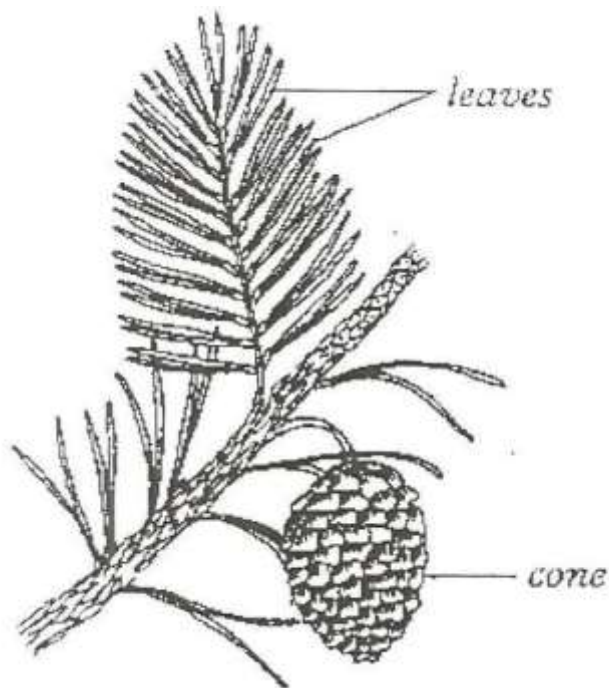
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The diagram below represents a certain plant species.



- a) State the class to which the plant belongs. (1 mark)

.....
.....

- b) State the difference between members of Gymnospermaphyta and Atngiospermaphyta (2 marks)

15. Give two reasons why a spider is classified under Phylum Arthropoda. (2 marks)

.....
.....
.....
.....

16. (a) Define the following terms as used in ecology. (2 marks)
- i) Population

.....

.....

- ii) Autecology

.....

.....

From three students wanted to estimate the population of grasshoppers in 5km^2 grass field near a school compound. They captured 36 grasshoppers and marked them before returning them back to the field. After two days they made another catch of grasshoppers. They collected 45 grasshoppers of which only 4 had marks.

- i) State why the second capture was done after two days. (1 mark)

.....

.....

- ii) From the data calculate the population size of grasshoppers in the grass field.

(2 marks)

.....

.....

In mitosis in animals chromatids failed to separate and move to opposite poles

- a) Name the organelle that the cell was lacking (1 mark)

.....

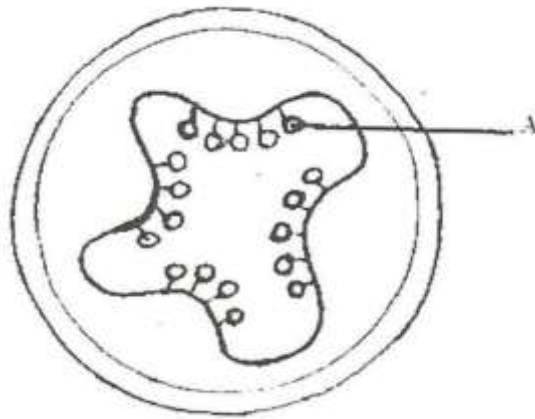
.....

- b) Name two regions in plants where cells actively undergo mitosis (2 marks)

.....

.....

The diagram below represents a transverse section of an ovary from a certain flower.



- a) Name the structure labeled A. (1 mark)

.....
.....

- b) Name the type of placentation illustrated in this diagram. (1 mark)

.....
.....

19. (a) State the functions of the following parts (2 marks)

i) Endometrium

.....
.....

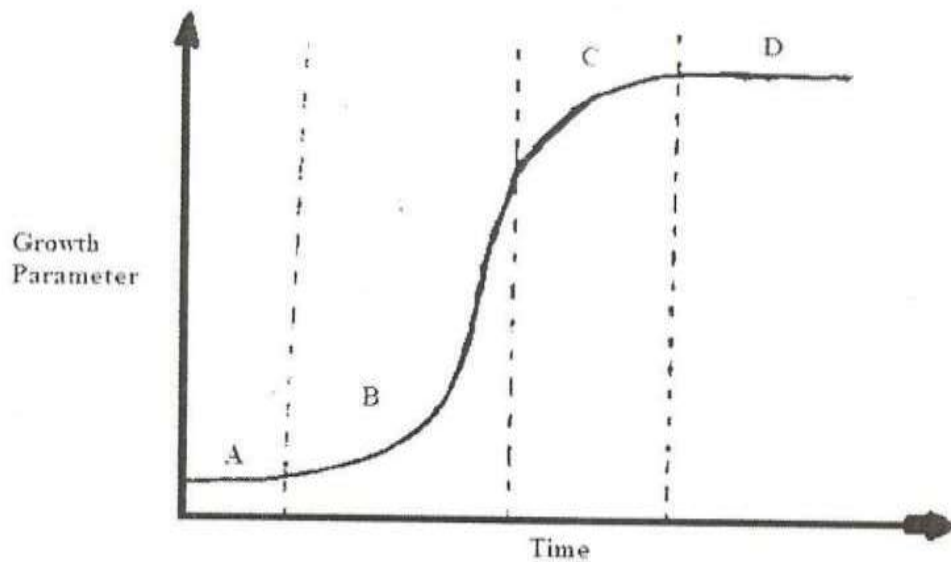
ii) Epididymis

.....
.....

- b) What mechanism facilitates the movement of the ovum towards the uterus?

(1 mark)

Use the diagram below to answer questions that follow.



a) Identify the type of growth curve shown. (1 mark)

.....

b) State one factor that leads to phase labeled B (1 mark)

.....

21. Give two differences between epigeal and hypogeal germination (2 marks)

.....

State the function of juvenile hormone in growth and development of insects.

(1 mark)

.....

23. (a) What is sex linkage? (1 mark)

.....

.....

.....

.....

(b) Give two sex linked genes found on the Y chromosome. (2 marks)

.....

.....

.....

.....

24. Below is a nucleotide strand

A	A	G	T	C
---	---	---	---	---

a) Identify the type of nucleic acid (1 mark)

.....

.....

b) Give a reason for your answer in (a) above (1 mark)

.....

.....

25. (a) What are analogous structures? (1 mark)

.....

.....

.....

.....

(b) Give one example of analogous structures. (1 mark)

.....

.....

(c) State comparative embryology as an evidence of organic evolution (2 marks)

.....

.....

.....

.....

26. State two structural differences between apes and human beings. (2 marks)

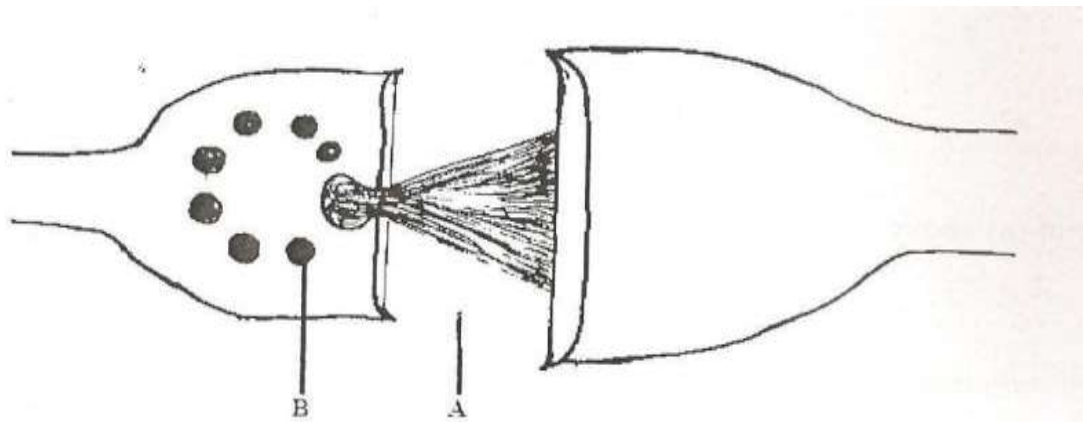
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.....

The diagram below represents parts of a synapse.



a) Name part labeled A. (1 mark)

.....

.....

b) What is the function of part labeled B. (1 mark)

.....

.....

c) On the diagram show the direction of flow of impulse (1 mark)

.....

.....

28. (a) State the function of cerebrospinal fluid (1 mark)

.....
.....

(b) How is the choroid of the eye adapted to its function? (1 mark)

.....
.....
.....
.....

29. (a) Name a support tissue in plants that is not thickened. (1 mark)

.....
.....

(b) State the type of skeleton found in all vertebrates. (1 mark)

.....
.....

PROJECTION NO. 64

NAME.....

INDEX NO.....

SCHOOL.....

CANDIDATE'S SIGNATURE.....

DATE.....

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Write your **Name**, **Index Number** and **School** in the spaces provided above.

Sign and write the **date** of examination in the spaces provided above.

Answer **all** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper.

Additional pages must not be inserted.

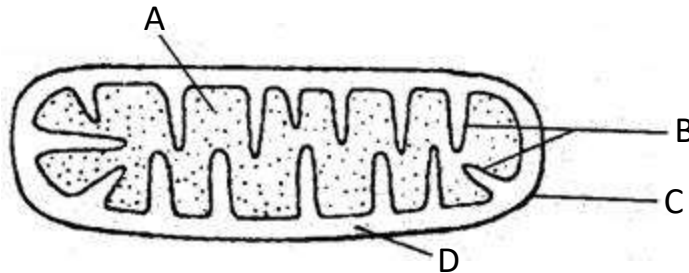
Check the question paper to ascertain that all the pages are printed and that no questions are missing.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1-26	80	

1. Name the causative agent of cholera. (1 mark)

The diagram **below** represents a cell organelle.



- (a) Identify the organelle. (1 mark)

-
- (b) Name the part labelled **B**. (1 mark)

-
- (c) State the function of part labelled **A**. (1 mark)

State the functions of the following parts of a light microscope.

Condenser.(1mark)

- (b) Diaphragm. (1 mark)

3. (a) Explain **three** ways in which a red blood cell is adapted to its function. (3marks)

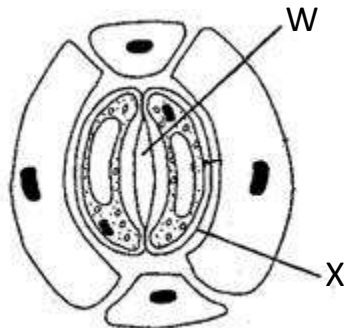
- (b) In which form is carbon (IV) oxide transported. (1 mark)

State the functions of the following organelles.

- (i) Centriole. (1 mark)

- (ii) Nucleolus. (1 mark)

The diagram **below** shows part of plant tissue.



Name cell labelled **X** and part labelled **W**. (2 marks)

X

W

State **two** adaptations of cell labelled **X** to its function.

(a) Differentiate between hypogeal germination and epigeal germination. (2 marks)

(b) State **two** causes of dormancy in seed. (2 marks)

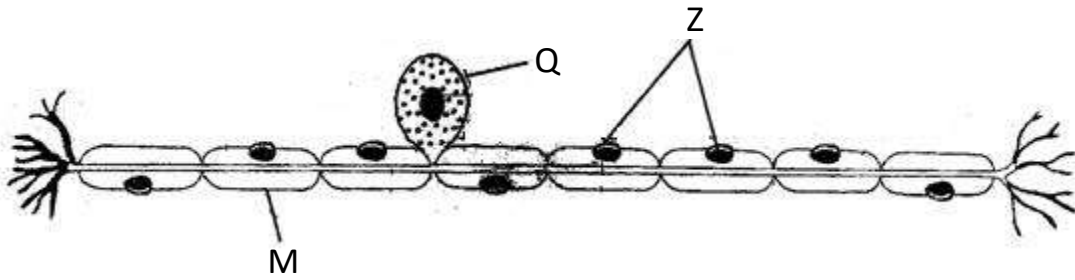
8. (a) Define polyploidy. (1 mark)

(b) Name **three** disorders resulting from gene mutations. (3 marks)

(a) Distinguish between homologous and analogous structure. (2 marks)

(b) Explain the term continental drift as used in evolution. (2 marks)

The diagram **below** represents a sensory cell.



- (a) Identify with a reason the type of neurone above. (1 mark)

Reason: (1 mark)

- (b) Name parts labelled. (2 marks)

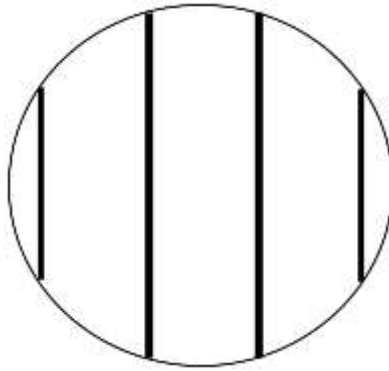
Q

Z

11. (a) Name **three** supportive tissues in plants. (3 marks)

- (b) Name the type of muscles found in the gut. (1 mark)

A form one student trying to estimate the size of onion cells observed the following on the microscope's field of view.



- (a) Define the term resolving power. (1 mark)

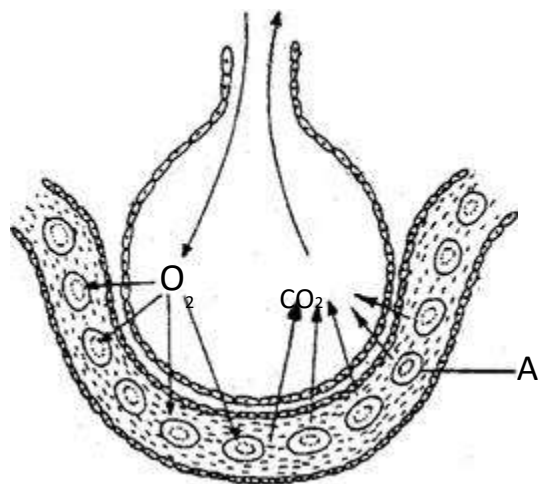
If the student counted 20 cells across the field of view calculate the size of one cell in micrometers. (2 marks)

13. (a) Distinguish between transpiration and guttation. (2 marks)

(b)

State **two** importance of guttation in hydrophytes. (2 marks)

The diagram **below** shows the exchange of gases in alveolus.



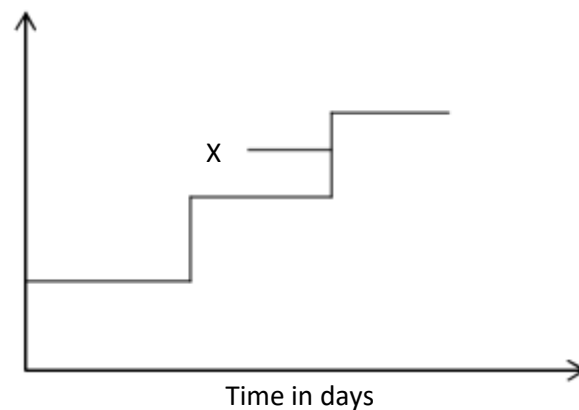
- (a) State how the alveoli are adapted to their function. (3 marks)

(b) Name the cell labelled **A**. (1 mark)

(a) Distinguish between respiratory quotient and oxygen debt. (2 marks)

Name the site where anaerobic respiration occurs in the cell. (1 mark)

Study the graph **below** and answer the questions that follow.



(a) What is the name given to the type of graph? (1 mark)

(b) What is the name used to describe point **X**. (1 mark)

(c) State the importance of part X. (1 mark)

(d) Name the phylum in which the graph represented in above occurs. (1 mark)

17. (a) Define the term natural selection. (1 mark)

(b) Name **three** evidence of organic evolution. (3 marks)

State **one** adaptation of the following parts of mammalian eye.

(i) Fovea centralis. (1 mark)

(ii) Sclera. (1 mark)

(iii) Cilliary body. (1 mark)

Name the cartilage found between vertebrae of the vertebral column.(1 mark)

20. (a) Differentiate between gaseous exchange and ventilation (2 marks)

Name the respiratory sites of the following:

(i) Fish (1 mark)

(ii) Insects (1 mark)

21. (a) Name **two** cardiovascular diseases. (2 marks)

If the nerve supply to the heart of a mammal is severed the rhythmic heart contraction and relaxation will go on and heart continues to beat. Explain why.(2 marks)

22. Name **two** major branches of Biology. (2 marks)

(a) State the functions of the following apparatus.

(i) Bait trap. (1 mark)

(ii) Pooter. (1 mark)

24. State **two** structural adaptations of veins to their function. (2 marks)

25. Name the process that results to formation of tissue fluid. (1 mark)

26. What is serum? (1 mark)

PROJECTION NO. 65

BIOLOGY

PAPER I

TIME: 2 HOURS

NAME:.....ADM.NO:.....CLASS:.....

INSTRUCTIONS

Answer all questions in the spaces provided

FOR EXAMINER'S USE ONLY

80 MARKS

Rewrite the correct form of the scientific name for the African elephant

Loxodonta Africana.

(1 mark)

.....

A potato cylinder measuring 100mm was placed in a concentrated salt solution for 30 minutes. Describe its texture and appearance after 30 minutes. (3 marks)

.....
.....
.....
.....
.....
.....

3. a) State one adaptation of palisade cell to its function (1mark)

.....
.....

- b) State the products of photolysis (2marks)

.....
.....

4. a) What is the function of carnassial teeth (1mark)

.....
.....

5. The structure below is a centriole found in animal cells only. (2 marks)



Centriole

State its functions in animal cells.

i)

ii).....

a) People can die when they inhale gases from burning charcoal in poorly ventilated rooms. What compound is formed in the human body that leads to such deaths (1 mark)

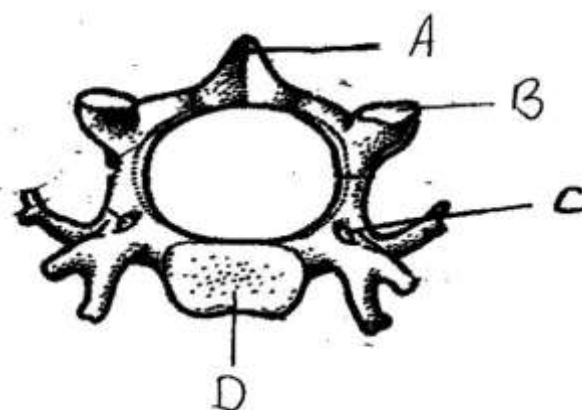
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.....

Most carbon (IV) oxide is transported from tissues to the lungs within the red blood cells and not in the blood plasma.

Give an advantage of this mode of transport. (1 mark)

.....
.....
.....

Study the diagram below and answer the questions that follow



a) Identify the diagram above (1mark)

.....

.....

b) State one reason for your answer in (a) above (1mark)

.....

.....

.....

c) Name the parts labeled A, B and D (3marks)

A.....

B.....

D.....

d) State the function of the part labeled C (1mark)

.....

.....

.....

a) State two disadvantages of fossil records as an evidence of evolution (2marks)

.....

.....

.....

b) What is adaptive radiation (1mark)

.....

.....

.....

9. a) Which vitamin is synthesized by bacteria in the human colon (1mark)



.....
.....

b) State the function of the vitamin named in (a) above (1 mark)

.....
.....
.....

10. Name the structure in plants involved in the following functions (3 marks)

a) Absorption of water

.....

b) Transport of water

.....

c) Translocation of food

.....
.....

Study the food chain below and answer the questions that follow

Green plants → Insects → Lizards → Eagles → Snakes

a) Name the trophic level occupied by the

- Green plants (1 mark)

.....
.....

- Eagles (1mark)

.....

.....

b) Explain why energy from green plants to insects is more than that from lizards to snakes (2marks)

.....

.....

.....

a) With a reason name the structure responsible for intermittent growth in an insect

Structure (1mark)

Reason

.....(1 mark)

b) What is the hormone responsible for growth in an insect (1mark)

.....

.....

13. a) What is reversed stomatal rhythm in xerophytes (1mark)

.....

.....

.....

b) How can this phenomenon in (a) above be a limitation to the plant in terms of gaseous exchange (1mark)

.....

.....

.....

a) A dog weighing 15.2kg requires 216kJ while a mouse weighing 50g requires 2736KJ per day.

Explain

(2marks)

.....

.....

.....

.....

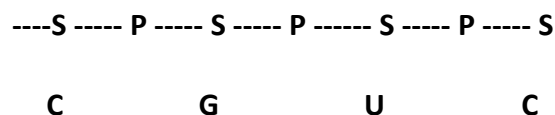
b) What is the end product of respiration in animals when there is insufficient oxygen supply

(1 mark)

.....

.....

The figure below is a structural diagram of a portion from a nucleic acid strand



a) Giving a reason, name the nucleic acid to which the portion belongs (2 marks)

Name

.....

Reason

.....

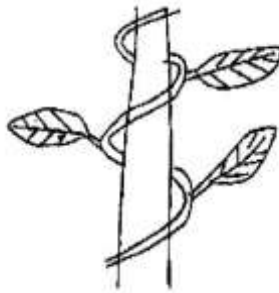
Write down the sequence of bases of a complimentary strand to that shown above (1 mark)

.....

.....

.....

The figure below shows a stem of a plant growing round a tree trunk



- i) What is the name of the response which causes the twisted growth (1 mark)

.....

.....

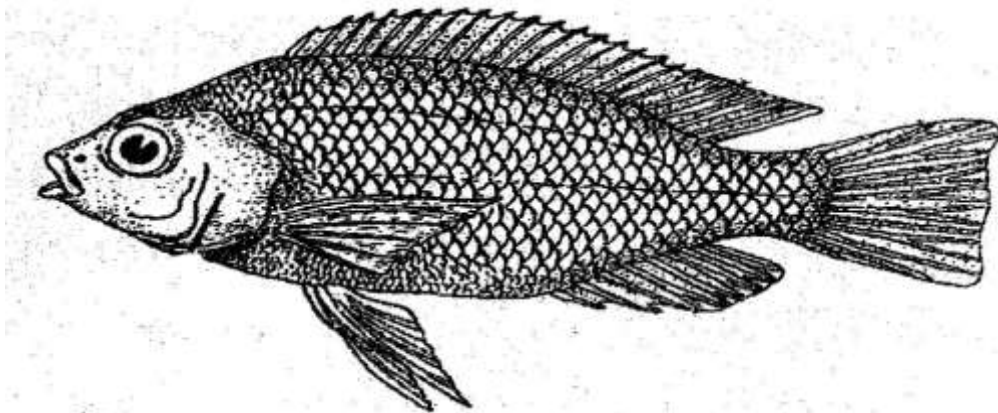
- ii) Explain how the twisting process is accomplished (2 marks)

.....

.....

.....

Below is a diagram of an organism



i) State the class which the organism belongs to (1 mark)

.....

.....

ii) State two observable characteristics used to classify the organism in the class you have mentioned in (i) above (2 marks)

.....

.....

.....

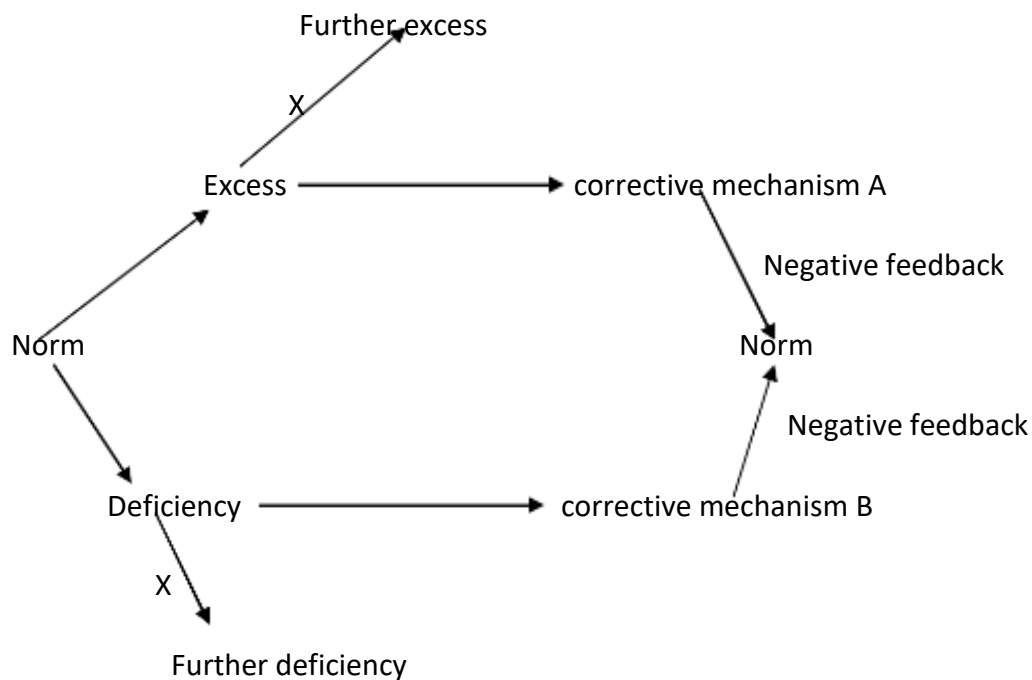
18. State two examples of mutagens (2 marks)

.....

.....

.....

Study the diagram below and answer the questions that follow



a) Name the principle labeled X (1mark)

b) If the above diagram represented blood sugar regulation

i) State the corrective mechanisms carried out at A (2marks)

.....

ii) The condition that may result from the further excess (1mark)

.....

iii) The hormone that would be responsible for correcting the deficiency (1mark)

.....

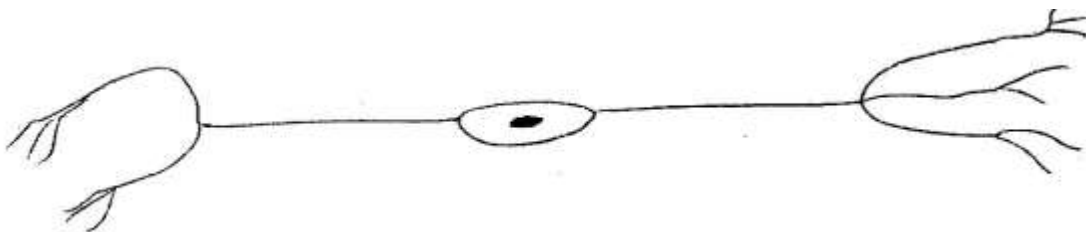
20. Name the main sites of gaseous exchange in (3 marks)

i)

ii)

iii)

Below is a diagram illustrated for an animal tissue



a) What is the identity of the illustrated diagram (1mark)

.....

.....

b) Where in the human body can the illustrated be found (1 mark)

.....

.....

c) What makes it very efficient for its function of impulse transmission (1 mark)

.....

.....

.....

22. a) Name the three strengthening tissues in plants (3 marks)

.....

.....

.....

b) State two ways in which the xylem is adapted to its function (2marks)

.....

.....

.....

A leguminous plant uprooted showed some feature on its roots as shown below



i) State the identity of Z (1 mark)

.....
.....

ii) Name the bacteria in Z (1 mark)

.....
.....

iii) Name the relationship between the named bacteria and the root at Z (1 mark)

.....
.....

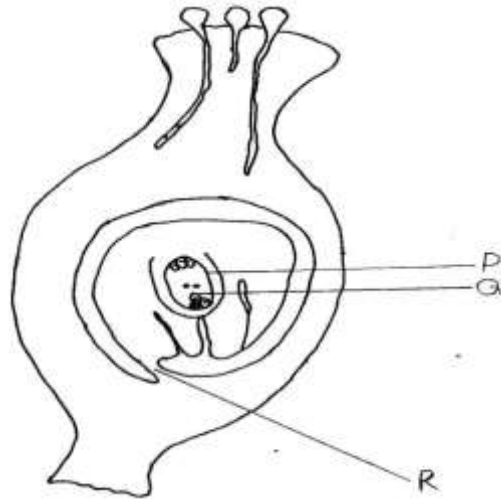
iv) What mineral element is availed by the bacteria in Z to the plant (1 mark)

.....
.....

v) Name one organism that reduces the element named in (iv) above reducing its availability to plants (1mark)

.....
.....

Study the reproductive structure below



a) Name the parts labeled P and Q (2marks)

P.....

Q.....

b) State the function of the part labeled R (1mark)

.....
.....

c) How do the following factors hinder self-pollination in plants

i) Protandry (1mark)

.....
.....
.....

ii) Self sterility

(1mark)

.....

.....

.....

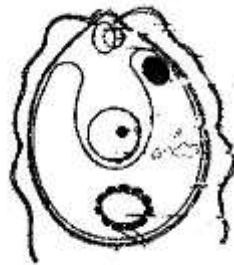
25. State two functions of the enzyme thrombokinase in blood clotting process (2marks)

.....

.....

.....

Below is a diagram of an organism



a) What is the identity of the organism

(1mark)

.....

b) Into which kingdom does the organism belong

(1mark)

.....

c) Other than the locomotive structure shown by the above organism name two other locomotive structures used by other members of the above named kingdom (2marks)

.....

.....

.....

PROJECTION NO. 66

NAME.....INDEX NO.....
CANDIDATES' SIGNATURE.....DATE.....
SCHOOL.....

231/1
BIOLOGY
PAPER 1
THEORY
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES.

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

Answer **ALL** questions in the spaces provided above.

Answers must be written in the spaces provided on the question paper. Additional pages must not be inserted.

FOR EXAMINERS' USE ONLY.

Question	Maximum Score	Candidates' Score
1-34	80	

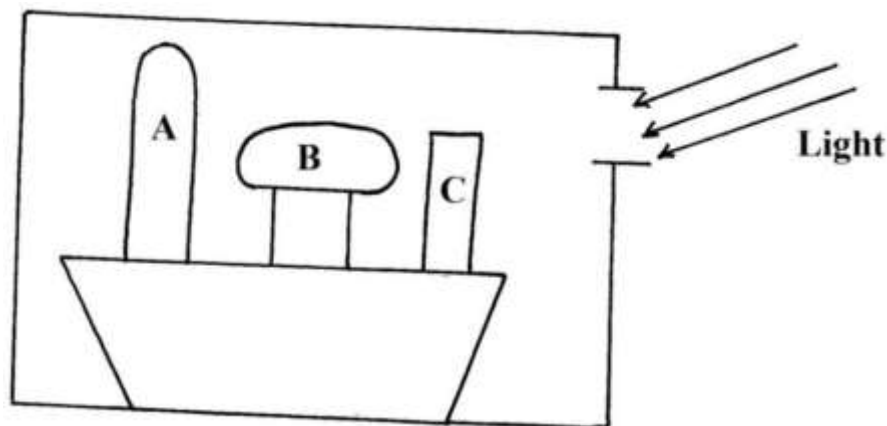
This paper consists of 8 printed pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and no questions are missing.

1 Name the element obtained from insects by insectivorous plants. (1mk)

.....
.....

2 An experiment was set up using seedlings as shown in the diagram below.



a) What was the aim of the experiment? (1mk)

.....
.....

b) Why were seedlings B and C included in the experiment? (1mk)

.....
.....

3 State the importance of the following processes that take place in human nephron.

a) Ultrafiltration (1mk)

.....
.....

b) Selective reabsorption (1mk)

.....
.....

4 State the functions of centrioles in a cell. (2mk)

.....
.....
.....

- 5 State **ONE** process that takes place during the light stage and ONE that takes place in the dark stage of photosynthesis. (2mks)

Light stage;

.....
.....

Dark stage;

.....
.....

- 6 Give a reason why a diet consisting of maize meal and cabbage if eaten over a long period may lead to Kwashiorkor in children. (2mks)

.....
.....
.....

- 7 a) What is meant by non-disjunction? (1mk)

.....
.....

- b) Give **ONE** example of continuous variations in humans. (1mk)

.....
.....

- 8 State the functions of the following parts of mammalian ear.

- a) Ear Ossicles. (1mk)

.....
.....

- b) Semi-circular canals. (1mk)

.....
.....

- c) Eustachian tube. (1mk)

.....
.....

Give a reason why primary productivity in an aquatic Ecosystem decreases with depth.
(1mk)

10 State **TWO** functions of the substance secreted by sebaceous glands. (2mks)

11 a) What is homeostasis? (1mk)

Name **3** processes in the human body in which homeostasis is involved.
(3mks)

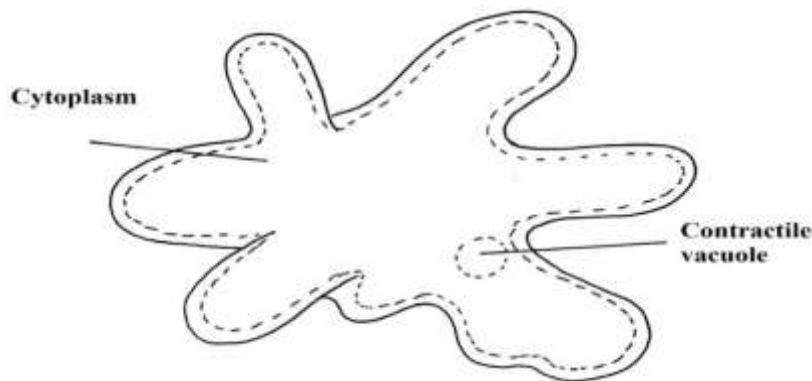
12 Name the regions in plants where the following take place. (2mks)

Primary growth

Secondary growth.

13 State **THREE** reasons for classifying organisms. (3mks)

A student observing a drop of water under the high power objective lens of a microscope observed an organism and drew the following organism.



- a) Suggest the kingdom to which the organism belongs. (1mk)

.....

- b) Identify the organism. (1mk)

.....

- c) Give an example of a disease caused by the organism. (1mk)

.....

In an experiment, the pituitary gland of a rat was removed.

State the effect this will have on the quantity of urine produced by the rat.

(1mk)

.....

- b) Give a reason for your answer in (a) above. (1mk)

.....

- 16 State the functions of the following parts of a light microscope. (2mks)

Objective lens

.....
.....
.....

Diaphragm

.....
.....

17 State **THREE** structural differences between arteries and veins in mammals(3mks)

Arteries	Veins

18 State **TWO** ways in which plants compensate for their inability to move from one place to another. (2mks)

.....
.....
.....
.....

19 Distinguish between parthenogenesis and parthenocarpy. (2mks)

.....
.....
.....
.....

20 In view of **modern** evolution , explain why Lamarkian theory is unacceptable(2mks)

.....

.....

.....

.....

21 What is the functional difference between a tendon and a ligament? (1mk)

.....

.....

22 Name **TWO** components of blood that are not present in the glomerular filtrate(2mks)

.....

.....

.....

23 a) A person was not able to see far objects clearly but could view near objects clearly. Name the eye defect the person was suffering from. (1mk)

.....

.....

b) How can the defect be corrected? (1mks)

.....

.....

.....

a)Name **TWO** sites where gaseous exchange takes place in terrestrial plants. (2mks)

.....

.....

.....

State the importance of the following features in gaseous exchange.

i) Cartilage in the trachea. (1mk)

.....

.....

ii) Moisture on the surface of the alveoli. (1mk)

.....
.....

25 Explain how the following adaptations minimize the rate of transpiration.

a) Sunken stomata (1mk)

.....
.....

b) Leaf drooping (1mk)

.....
.....

26 State the role of decomposers in an ecosystem. (1mk)

.....
.....

27 State **THREE** advantages of asexual reproduction in organisms. (3mks)

.....
.....
.....
.....

28 Define the following terms as used in Ecology. (4mks)

Biosphere.

.....
.....
.....

Population.

.....
.....
.....

Standing crop.

.....
.....
.....

Carrying capacity.

.....

.....

.....

29 a) Distinguish between Homologous and Analogous structures. (2mks)

.....

.....

.....

b) Give an example in each cases the structures in (a) above. (2mks)
Homologous structure.

.....

.....

.....

.....

30 Explain why digestion of starch stops shortly after food enters the stomach.(1mk)

.....

.....

31 Explain why one fails to see clearly on moving from a brightly lit room to a poorly lit room. (2mks)

.....

.....

.....

.....

32 What is the significance of meiosis. (2mks)

.....

.....

.....

33 Explain how the Erythrocytes are adapted to perform their functions. (3mks)

.....

.....
.....
.....
.....
34 State **ONE** function of each of the following parts of the brain. (2mks)

Hypothalamus.

.....
.....
Cerebrum.

.....
.....
END

PROJECTION NO. 67

Name..... Index No:.....

231/1

Candidate's Signature

BIOLOGY

Date:

INSTRUCTIONS TO CANDIDATES

Write your **name** and **index number** in the spaces provided above
Sign and write the **date** of examination in the spaces provided.
Answer **all** the questions in the spaces provided.

For Examiners Use Only

Question	Maximum score	Candidate's score
1- 30	80	

This paper consists of 11 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

1. Give **three** examples of continuous variations in human beings (3mks)

.....

.....

.....

2. (i) Name the main product of the dark stage of photosynthesis (1mk)

.....

- (ii) State the importance of chlorophyll in photosynthesis (1mk)

.....

.....

3. (a) Define the term balanced diet (1mk)

.....

.....

.....

- (b) State the importance of roughage in a diet (1mk)

.....

4. (a) How is the *fovea centralis* adapted for its function in human eye (1mk)

.....

.....

- (b) A person was not able to see far objects clearly but could view near objects clearly. Name the eye-defect the person had (1mk)

.....

.....

(c) How can the defect be corrected (1mk)

.....

5. (a) What is fertilization ? (2mks)

.....

.....

(b) Explain how double fertilization takes place in plants (2mks)

.....

.....

In an experiment, the pituitary gland of a rat was removed

(a) State the effect this will have on the quantity of urine produced by the rat. (1mk)

.....

.....

(b) Give a reason for your answer in (a) above (1mk)

.....

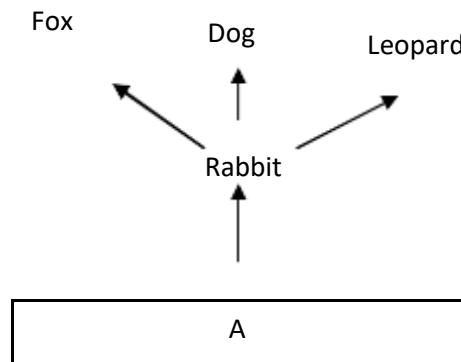
.....

7. State two importance of sexual reproduction (2mks)

.....

.....

The diagram below show part of a food relationship in an ecosystem



(a) Name the food relationship shown in the diagram (1mk)

.....

(b) Name the trophic level occupied by organism A (1mk)

.....

(c) What is the main source of energy in the ecosystem shown in the diagram above? (1mk)

.....

.....

9. State the function of the diaphragm in the light microscope (1mk)

.....

10. Explain the role of antidiuretic hormone when there is less water in the human body (3mks)

.....

.....

.....

State the function of each of the following organelles

(a) Centrioles(1mk)

.....

.....

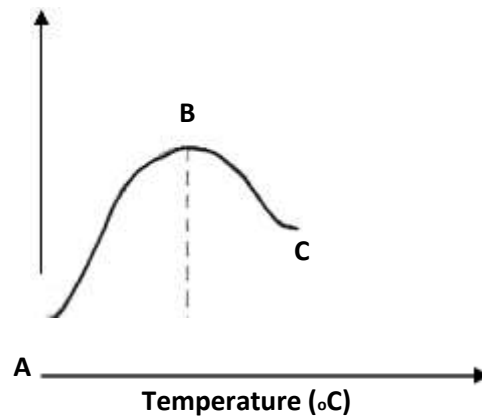
(b) Golgi body

(1mk)

.....

.....

The graph below shows action of heat on enzyme reaction



(a) What is the effect of temperature on the rate of enzyme reaction ? (2mks)

.....

.....

(b) State the relationship between temperature and enzyme activity (2mks)

.....

.....

13. Distinguish between divergent and convergent evolution (2mks)

.....

.....

14. State **three** distinguishing features for members of *phylum chordata* (3mks)

.....

.....

.....

15. (a) State the reasons for the following adaptations of the xylem vessels (2mks)

(i) Narrow lumen:

.....

.....

(ii) Lack of cross walls

.....

.....

(b) State **two** distinguishing features of the phloem sieve tubes (2mks)

.....

.....

State the economic importance of the following plant excretory products

(a) Caffeine (2mks)

.....

(b) Quinine (1mk)

.....

Explain why a baby loses more heat per unit weight than an adult when exposed to the same environmental conditions (2mks)

.....

.....

During oxidation of certain food substances, the respiratory quotient was found to be 0.718

(i) Name the type of food substance being oxidized (1mk)

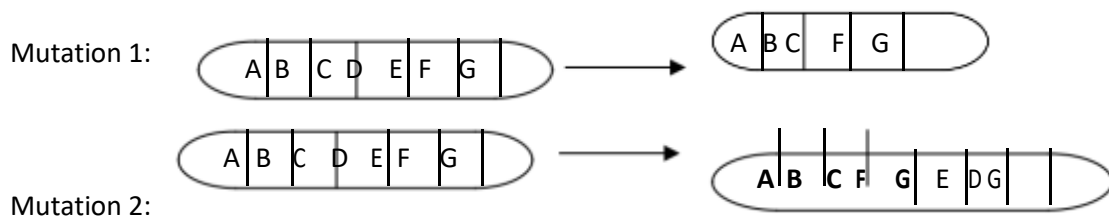
.....

(ii) State **two** advantages of using the food substances named (2mks)

.....

.....

The diagram below shows various types of gene mutations



(c) Identify the type of gene mutation shown above (2mks)

Mutation 1

.....

Mutation 2

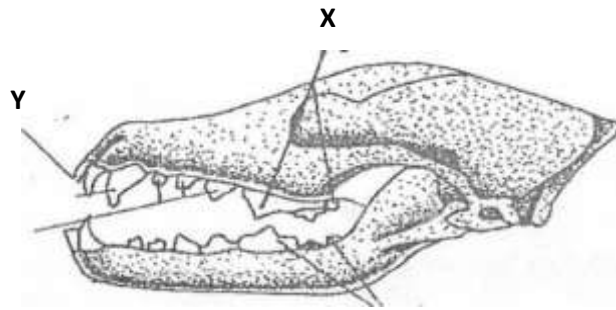
.....

(d) Distinguish between gene and chromosomal mutations (2mks)

.....

.....

The diagram below shows dentition of a dog



(a) (i) Name the part labeled X (1mk)

.....

(ii) Give a reason for your answer in a (i) above (1mk)

.....
.....

(b) State how part labeled Y is adapted to its function (1mk)

.....

The diagrams below represents a nerve cell



Cell body

(a) Identify the nerve cell (1mk)

.....

(b)(i) Give a reason for your answer in (a) above (1mk)

.....

(iii) Show by use of an arrow the direction of flow of the nerve impulses

.....

(a) State the importance of the following features in gaseous exchange

(i) Cartilage in the trachea (1mk)

.....

.....

(ii) Moisture on the surface of alveoli. (1mk)

.....

.....

(b) Name **two** sites where gaseous exchange takes place in terrestrial plants (2mks)

.....

.....

During germination and early growth, the dry weight of endosperm decreases while that of the embryo increases. Explain (2mks)

.....

.....

The table below shows the percentage composition of blood plasma and urine for four substances

Component substance	Blood plasma %	Urine %
Urea	0.03	2.0
Water	90	90
Plasma proteins	8.0	0
Glucose	0.1	0

(a) Account for the absence of plasma proteins in urine (1mk)

.....

.....

(b) Urea concentration being greater in the urine than in the blood plasma (1mk)

.....

.....

25. State **three** advantages of asexual reproduction in organisms (3mks)

.....

.....

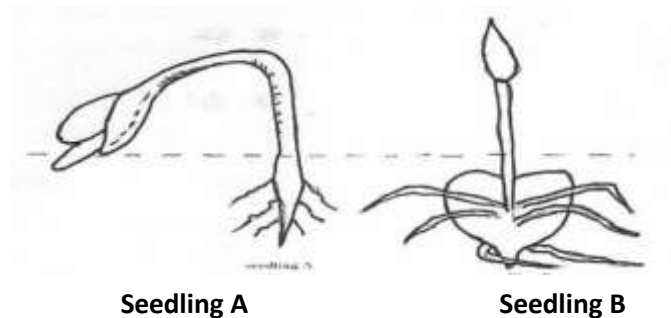
.....

26. Explain how the human eye accommodates an image from a far distant object (2mks)

.....

.....

The diagram below represents a stage of growth in two different seeds



(a) Identify the type of germination exhibited by seedlings A and B (2mks)

Seedling A

.....

.....

(f) State the role of oxygen in germination (1mk)

.....

28. . In view of modern genetics explain why Lamarckian theory is unacceptable. (2mks)

.....

.....

29. Define the following terms used in ecology (4mks)

(i) Biosphere

.....

(ii) Population

.....

(iii) Synecology

.....

(iv) Carrying capacity

.....

PROJECTION NO. 68

NAME.....

DATE.....

INDEX NO.

SIGNATURE

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES.

Write your name and index number in spaces provided above.

Sign and write the date.

Answer **ALL** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper. Additional pages must not be inserted.

This paper consists of 10 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

FOR EXAMINER'S USE ONLY.

Questions	Maximum score	Candidate's score
1-27	80	

1. List any three uses of energy obtained from the process of respiration. (3marks)

.....

.....

.....

.....

2. State the functions of the following organelles (3marks)

a) lysosomes

.....

.....

b) Golgi apparatus

.....

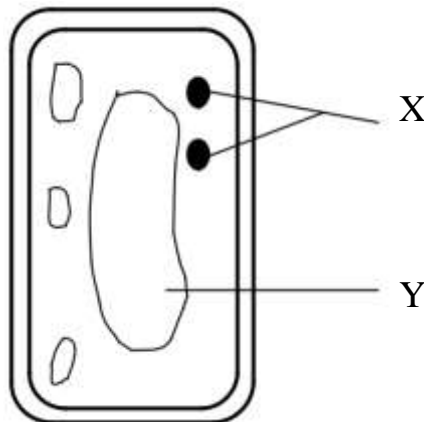
.....

Chloroplast

.....

.....

3. The diagram below represents a cell



Name the parts labeled X and Y

X

Y(2marks)

State why the structures labeled X would be more on one side than the other sid(1mark)

.....

.....

.....

4. Write the role of the following parts of microscope. (3marks)

Mirror

.....
.....
.....

Diaphragm

.....
.....
.....

Coarse adjustment knob

.....
.....
.....

Explain why plant cells do not burst when immersed in distilled water.

.....
.....
.....

An experiment was carried out to investigate the rate of reaction shown below

Sucrose \longrightarrow Fructose + Glucose

For the products; Fructose and Glucose to be formed, it was found that substance K was to be added and the temperature maintained at 37°C. When another substance L was added, the reaction slowed down and eventually stopped.

Suggest the identity of the substances K and L

K

L

(2marks)

Explain how substance L slowed down the reaction.

(1mark)

.....
.....
.....

7. (a) State the role of light in the process of photosynthesis. (2marks)

.....

.....

.

- (b) Name one product of dark reaction of in photosynthesis. (1mark)

.....

.....

.....

A solution of sugarcane was boiled with hydrochloric acid; sodium carbonate was added; cooled and benedict's solution was added then boiled. An orange precipitate was formed.

- (a) Why was the solution boiled with hydrochloric acid? (1mark)

.....

.....

- (b) Why was sodium carbonate added? (1mark)

.....

.....

.....

- (c) Name the type of reaction that takes place when simple sugars combine to form complex sugar. (1mark)

.....

.....

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- (a) State two functions of bile juice in the digestion of food?

(2marks)

.....

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.....

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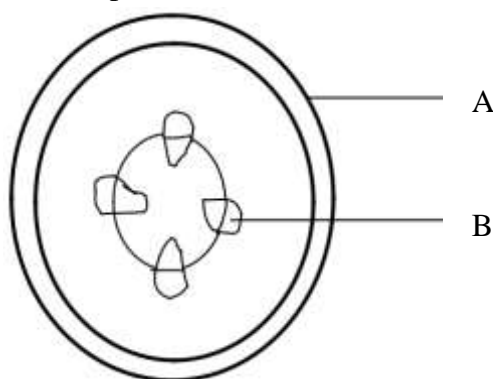
(b) How does substances concentration affect the rate of enzyme reaction? (1mark)

.....
.....

A certain animal has no incisors, no canines, six premolars and six molars in its upper jaw, in the lower jaw there are six incisors, two canines, six premolars and six molars. Write its dental formular? (2marks)

.....
.....
.....

The diagram below represents a transverse section of a young stem.



Name parts labeled A and B

A

B.....

12. People can die when they inhale gases from burning charcoal in poorly ventilated rooms.

What compound is formed in the human body that leads to such death? (1mark)

.....
.....

13. Name two structures used for gaseous exchange in plants. (2marks)

.....
.....
.....

14. Name the physiological process by which gas exchange takes place at the respiratory surface of animal and plants. (1mark)

.....

.....

15. a) Name the substance which accumulates in muscles when respiration occurs with insufficient oxygen (1mark)

.....

b) In what form is energy stored in muscles? (1mark)

.....

16. Explain why the body temperatures of a healthy human being must rise up to 39⁰c on a humid day (2marks)

.....

.....

.....

17. Name the part of the brain that trigger sweating (1mark)

.....

.....

.....

18. State two ways in which some fungi are beneficial to humans. (2marks)

.....

.....

.....

19. A millipede, grasshopper and crayfish all belong to Phylum Arthropoda. Mention three major characteristics that they have in common (3marks)

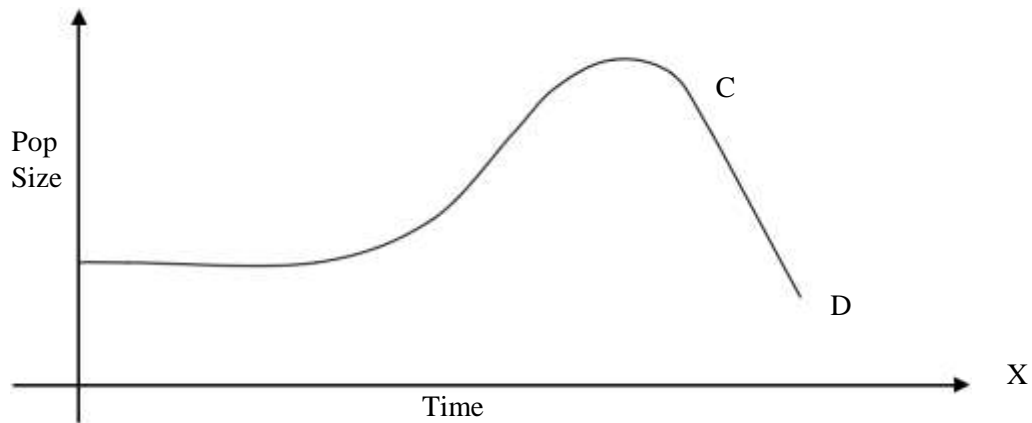
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The graph below represents a population growth of a certain herbivores in a grassland ecosystem over a period of time.



Suggest two factors that could have caused the population change between C and D.

(i)

.....

.....

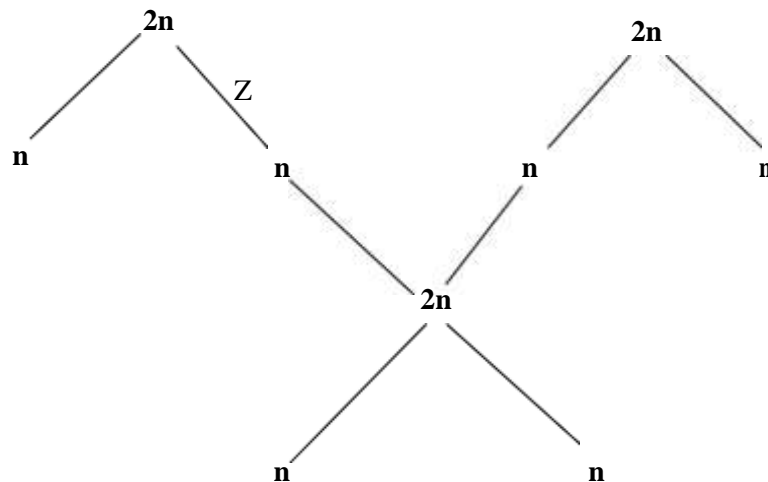
(ii)

.....

.....

.....

The chart below shows the number of chromosomes before and after cell division and fertilization in a mammal.



- a) What type of cell division takes place at Z? (1 mark)

.....

- b) Where in the body of a female does process Z occur? (1marks)

.....

22. State two physiological processes that are brought about by the application of gibberellic acid on plants. (2marks)

.....

23. The figure below is a structural diagram of apportion from nucleic acid strand

C ——— G ——— U ——— C

Giving a reason, name the nucleic acid to which the strand belongs Name

.....
.....

Reason

.....
.....

Write down the sequence of bases of a complimentary strand to that shown above,
(1mark)

.....
.....

Explain why Lamarck's theory of evolution is not accepted by Biologists today.(2marks)

.....
.....

b) Distinguish between homologous and analogous structures. (4marks)

.....
.....
.....
.....

25. Name the hormone responsible for apical

a) Dominance (1mark)

.....
.....

Euglena is positively phototactic, of what biological significance is this characteristic.
(1mark)

.....

.....

26. a) How are xylem vessels adapted for support? (1mark)

.....

.....

b) Give the name of special muscles that make the heart. (1mark)

.....

.....

27. State four ways in which respiratory surfaces are suited to their function. (4marks)

.....

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.....

28. State the role of insulin hormone in the body. (3marks)

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.....

How would one find out from a sample of urine whether a person is suffering from diabetes mellitus(2marks)

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.....

30. a) The action of ptyalin stops at the stomach. Explain (1marks)

.....

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.....
.....

b) State a factor that denatures enzymes (1mark)

.....
.....
.....

c) Name the features that increase the surface area of small intestines. (2marks)

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.....

31. a) State two characteristics that researchers select in breeding programmes. (2marks)

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.....

In a maize the gene for purple colour is dominant to the gene for white colour. A pure breeding maize plant with purple grains was crossed with heterozygous plant. Using letter G to represent the gene for purple colour work out the genotypic ratio of the offspring.

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PROJECTION NO. 69

NAME.....

DATE.....

INDEX NO. SIGNATURE

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES.

Write your name and index number in the spaces provided above.

Sign and write the date.

Answer **ALL** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper. Additional pages must not be inserted.

This paper consists of 9 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

FOR EXAMINER'S USE ONLY.

Questions	Maximum score	Candidate's score
1-27	80	

1. a) Name the organelle where Kreb's/ citric cycle take place in a cell. (1mark)

.....
.....

(b) Where are lysosomes synthesized (1mark)

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2. Distinguish between ecological niche and habitat. (2mark)

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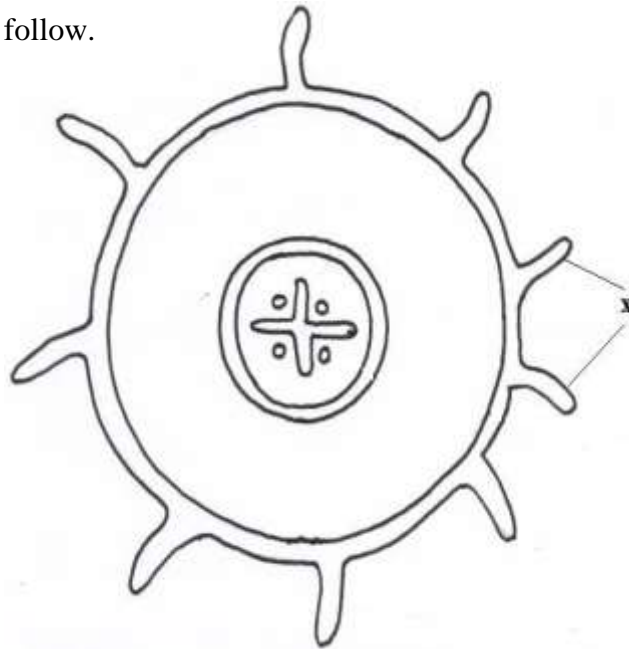
3. State the importance of osmo - regulation in organisms (2 marks)

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Explain why unicellular organisms such as paramecium lack complex organs for gaseous exchange. (2marks)

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The diagram below represents a transverse section of a plant part. Study it and answer the questions that follow.



a) Name the class in which the plant belongs. (1marks)

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b) Give a reason for answer (a) above (1mark)

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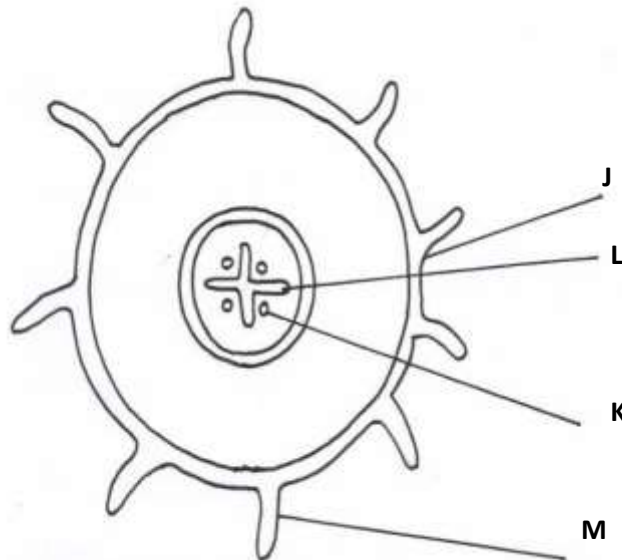
c) State one adaptation for the structures labeled X to their functions. (1mark)

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6. State the function of the following structures in the human n ear.

(a) Semi – circular canals.

(1mark)



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(b) Eustachian tube.

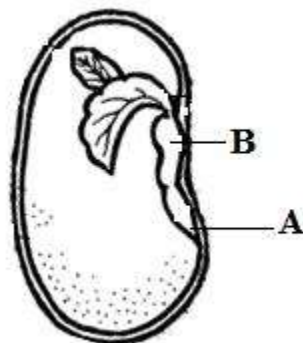
(1mark)

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The diagram below shows the internal structure of a broad bean seed. Study it and answer the questions that follow.



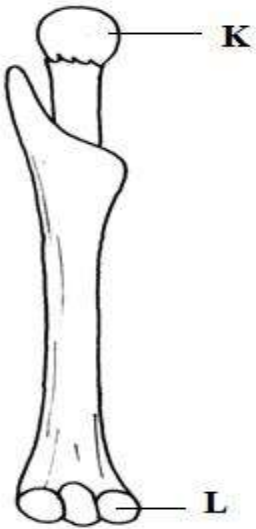
(a) Name the part labeled B.
(1 mark)

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(b) Why is it important that the part labeled A develops first during germination?(2 mark)
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8. Explain what causes global warming. (3 marks)
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9. The diagram below represents a mammalian bone.



(a) Identify the bone (1mark)
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(b) i) Name the bones that articulate with this bone at points K and L (2 marks) K
.....
L
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The equation below represents a metabolic process that occurs in the mammalian liver.



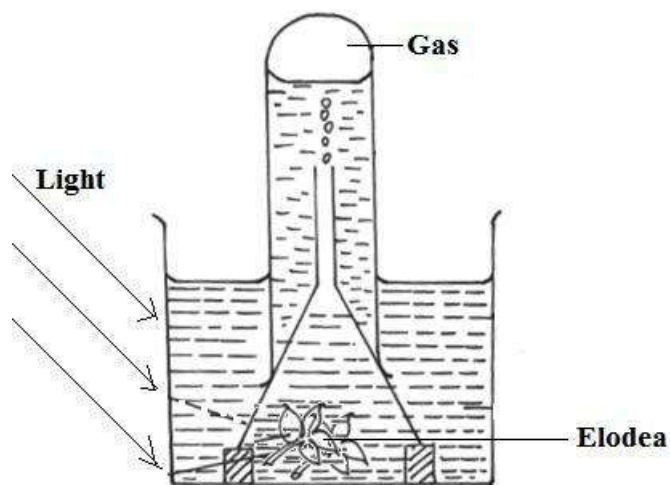
(a) Name the process (1 mark)

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.....

(b) What is the importance of the process to the mammal? (2marks)

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The diagram below represents a set up that was used to investigate a certain process in a plant.



(a) State the process that was being investigated. (1 mark)

.....
.....

Other than the factors shown, state two factors that would affect the process named in (a) above. (2 mark)

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12. Give an example of the sex linked trait in humans on

Y – Chromosomes

(1mark)

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X – Chromosomes

(1 mark)

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13. Explain why a rat has a higher food intake compared to a lizard of the same body weight.

(4 marks)

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14. (a) Mutua and Mwende used a light microscope to observe guard cells in a leaf surface.

They indicated a magnification of X 450 .Given that the eye piece was marked X10,
work out the objective

lens magnification.

(2 marks)

(b) State the function of fine adjustment knob. (1mark)

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State two structural differences between skeletal and smooth muscles. (2 marks)

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16. Outline two roles of active transport in human beings. (2 marks)

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17. State three advantages of asexual reproduction in plants. (3 marks)

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18. a).Name the causal organism for amoebic dysentery. (1 mark)

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.....

b) state three preventive measures of schistosomiasis in human beings (3 mark)

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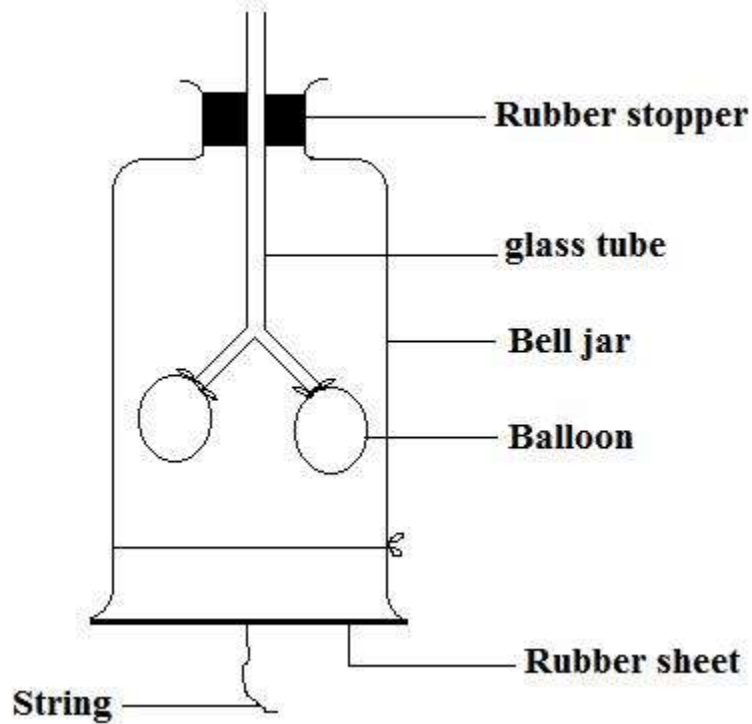
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Tom, a form two student set up the apparatus shown below to demonstrate the breathing mechanism in a mammal.



(a) What structure in a mammal is represented by each of the following? (2marks)

Glass tube

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Rubber sheet

.....

(b) Explain what will happen to the balloons if the rubber is pulled down wards. (2 marks)

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20. a) What is adaptive radiation?

(2marks)

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.....

b) Explain why crossbreeding is important in animal breeding.

(2 marks)

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.....

21. a) state the most suitable biological tool for collecting the following organisms:-

i) A moth from a coffee farm.

(1 mark)

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.....

ii) Ants from a tree trunk.

(1 mark)

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.....

b) State two distinguishing characteristics of the kingdom protista.

(2 mark)

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.....

22. a) Name the hormone that stimulate the maturation of the graafian follicles to release a mature ovum in female reproductive cycle.

(1mark)

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Explain why menstruation does not take place after fertilization in human beings.

(2marks)

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23. How does sunken stomata help in lowering transpiration? (3marks)

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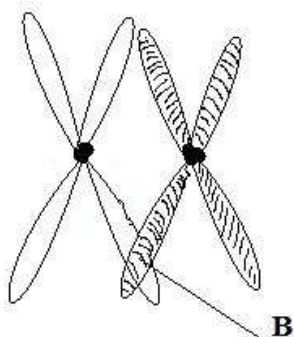
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24. The diagram below shows a phenomenon which occurs during cell division.



a) Identify the stage of cell division in which this phenomenon occurs. (1 mark)

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b) State the importance of the phenomenon taking place in the part labeled B. (2 marks)

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25. a) An organism was found to have a dental formula

$$\begin{array}{cccc} \text{i} & \frac{0}{3} & \text{c} & \frac{0}{1} & \text{pm} & \frac{3}{2} & \text{m} & \frac{3}{3} \end{array}$$

i) State the mode of feeding of the organism. (1mark)

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.....

ii) Give a reason for your answer in (i) above. (1 mark)

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.....

b) Name the vitamin which plays an important role in the formation of blood cells. (1mark)

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26. a) State one advantage of double circulation over single circulation. (1mark)

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b) State two adaptations of blood capillaries to their functions. (2marks)

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27. a) Name a growth hormone that has inhibitory effects in plants growth. (1mark)

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b) State two characteristics of a meristematic cells. (2marks)

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28. Write down two functions of exoskeleton in the phylum Arthropoda. (2 marks)

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PROJECTION NO. 70

NAME..... DATE.....

INDEX NO.SIGNATURE

231/1

BIOLOGY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES.

Write your name and index number in spaces provided above.

Sign and write the date.

Answer **ALL** the questions in the spaces provided.

Answers must be written in the spaces provided in the question paper. Additional pages must not be inserted.

This paper consists of 8 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

FOR EXAMINER'S USE ONLY.

Questions	Maximum score	Candidate's score
1-27	80	

1. Insects' blood is noted to lack a respiratory pigment. Explain (1 mark)

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.....

2. State the function of the following parts of a nephron.

- (i) Loop of Henle (1 mark)

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- (ii) Distal convoluted tubule. (1 mark)

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Most terrestrial plants do not grow well in water logged soils. Give a reason for this

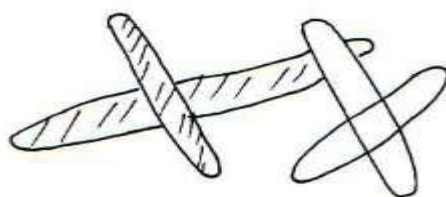
(1mark)

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The diagrams below show a pair of homologous chromosomes. Study them and answer the questions that follow.



- i) State the phenomenon shown above (1mark)

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(ii) What is the genetic significance of the phenomenon above? (2 marks)

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5. Give two destinations of food translocated from the leaves of plants. (2 marks)

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Name the organelle that is likely to be found in abundance in:

(a) An enzyme secreting cell.

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(b) Cells producing lipid related secretions.

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(c) Areas where the cells have ruptured

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7. A small boy remarked that his dog looks larger on cold days than on hot days. Give a biological explanation for this. (2 marks)

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The table below shows the percentage composition of carbon (IV) oxide and oxygen in inhaled and exhaled air.

Gases	Inhaled air	Exhaled air
Oxygen	20 %	17%
Carbon (IV) oxide	0.04%	4.0%

Explain the differences in percentage of the two gases in inhaled and exhaled air.

(a) Oxygen

(2 marks)

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(b) Carbon (IV) oxide

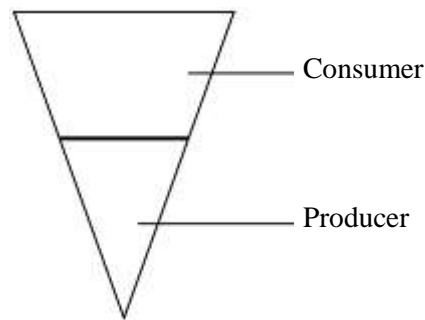
(2 marks)

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The diagram below represents a pyramid of biomass derived from a certain ecosystem.



(a) Suggest the type of ecosystem from which the pyramid was derived

(1 mark)

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(b) State the significance of short food chains in an ecosystem.

(1 mark)

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10. State two features of neurones that increase the rate of impulse transmission (2 marks)

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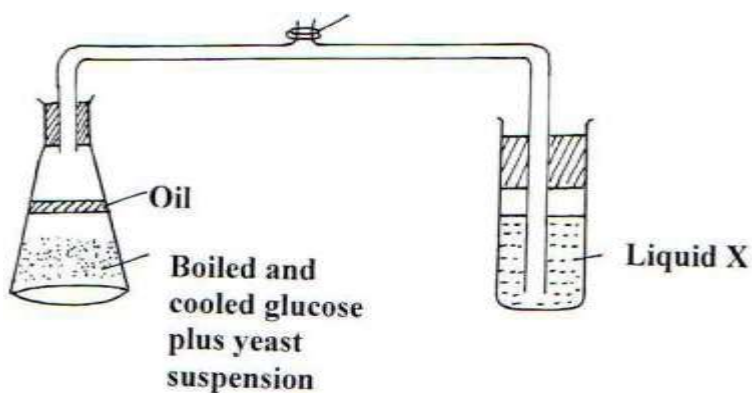
11. Distinguish precisely between diabetes mellitus and diabetes insipidus (2 marks)

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The set up below shows apparatus to demonstrate a certain biological process



(a) What biological process was being investigated in the experiment (1 mark)

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(b) Write down a word equation that represents the reaction above. (1 mark)

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In the above set up, why was it important to boil and cool glucose before adding yeast? (1 mark)

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Explain how the following occur during gene mutation.

Substitution(2marks)

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ii) Insertion

(2marks)

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13. (a) What are meristems?

(1mark)

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(b) (i) what is the role of cork – cambium in secondary growth?

(1mark)

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Name the meristem that is responsible for increase in length of stems

(1mark)

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14. State two functions of the spleen

(2 marks)

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15. Name the excretory products eliminated by the following animals.

(i) Tilapia.

(1 mark)

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(ii) Chicken.

(1mark)

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State the functions of the following parts of the human ear.

Ossicles(1mark)

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Name the causative organism of the following diseases.

Malaria(1mark)

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(ii) Bilharzia (1mark)

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18. Identify the part of light microscope which serve each of the functions described below

(i) Making rough focus (1mark)

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(ii) Reflecting light from the source (1 mark)

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19. State two characteristics of aerenchyma tissue. (2marks)

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20. What is the significance of transpiration in plants? (3marks)

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21. State two ways in which xylem vessels are adapted to their functions. (2marks)

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22. Distinguish between convergent and divergent evolution (1mark)

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23. State the characteristics that distinguish the following organisms into their respective classes (3 marks)

Millipedes, spider and tsetse fly.

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24. How do identical twins and fraternal twins arise?

(i) Identical twins (2 marks)

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(ii) Fraternal twins. (2 marks)

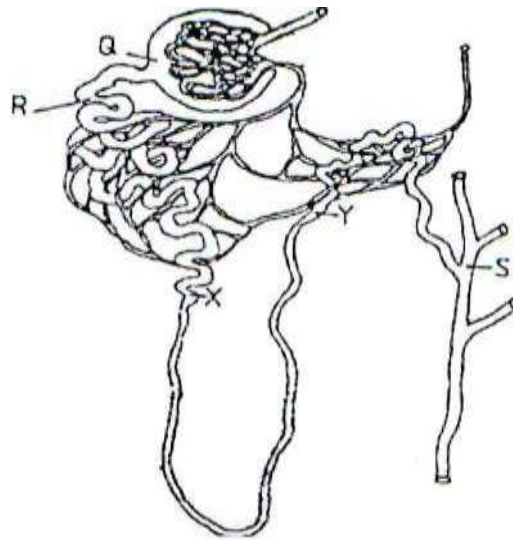
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25. The diagram below illustrates part of a nephron from a mammalian kidney.



(a) Name the fluid found in the part labeled Q.

(1 mark)

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Identify the process responsible for the formation of the fluid named in (a) above

(1mark)

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(c) Which two hormones exert their effect in the nephron?

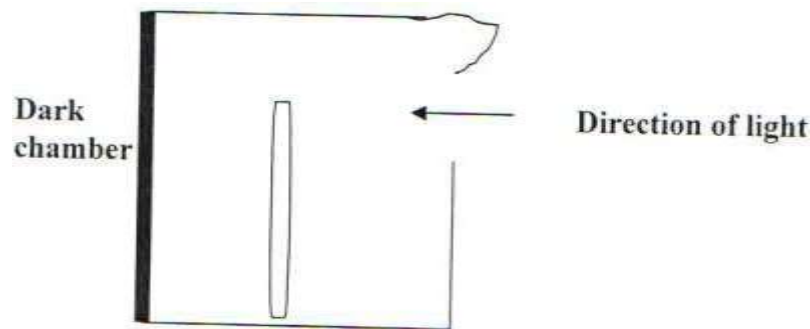
(2 marks)

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The diagram below shows a tip of a plant coleoptiles with light coming towards it from one side.



(a) How would the plant respond to light? (1 mark)

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(b) Give the name of such a response (1 mark)

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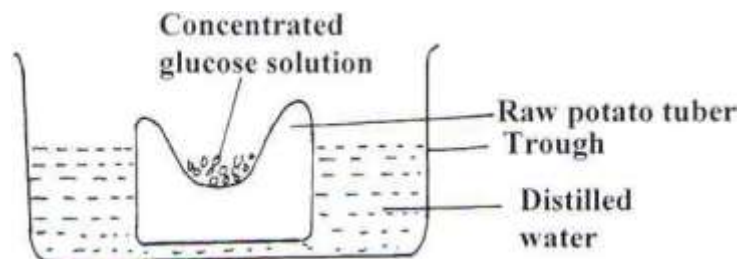
(c) What is the advantage of plants responding in this way? (2marks)

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The experiment illustrated below was set up to investigate a certain physiological process using a raw tuber.



(a) Suggest a possible physiological process that was being investigated. (1 mark)

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(b) Explain the results obtained in the above experiment after a few hours (2 marks)

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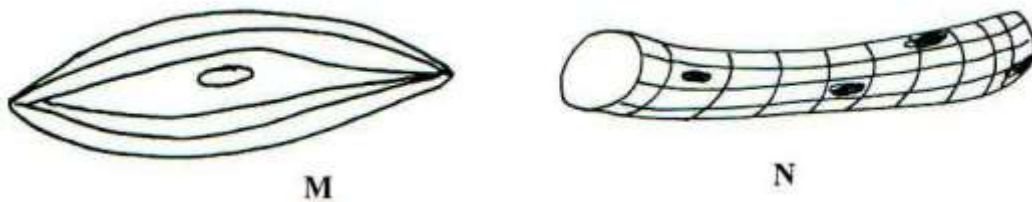
State the observations that would have been made if the experiment was repeated using boiled potato.

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28. (a) Give two functions of blood as a tissue. (2 marks)

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(c) The figures below illustrate specialized cells in an animal body.



(i) Identify the cells M and N (2 marks)

M

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.....

N

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.....

(ii) State the structural differences between M and N (2marks)

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(iii) Which of the above specialized cells is found in the gut? (1mark)

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