kenyaeducators@gmail.com

KCSE REVEALED 2021

BIOLOGY

PAPER II

This PDF consists of two sample exams that contains questions that are expected in the national exams 2021

For marking schemes call Mr Machuki 0795491185.

SAMPLE I

FORM FOUR

Kenya Certificate of Secondary Education

231/1 BIOLOGY

PAPER TWO

TIME: 2HRS

INSTRUCTIONS

1. Answer all questions in section A and question 6 in section B (It is compulsory)
2. Answer either question 7 or 8.

SECTION A (40MKS)

Answer all the questions in these section

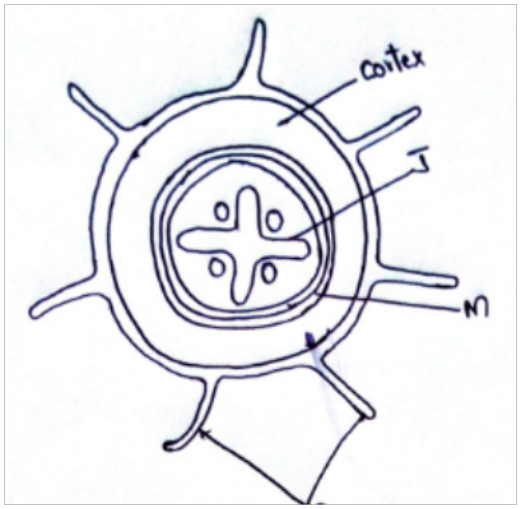
1. Haemophilia is a sex linked characteristic caused by a recessive gene located on one of the sex chromosomes.
   a) Name the chromosome onto which the gene for haemophilia is linked to (1mk)
   ……
   b) A normal man for the condition marries a normal woman for the condition but sadly one of their sons develop this condition from birth.
      i) What are the likely genotypes of this couple?
      (2mks)
      Man
      ……
      Woman
      ……
      ii) Using a punnet square, carry out a cross to show why the couple gave birth to haemophiliac son (4mks)
      Use (H),to represent the gene for normal condition and (h) to represent the gene for haemophilia

iii) Why is this haemophiliac condition very common in males than in female (1mk)

……

……

2. The figure below represents an organ obtained from a section of a plant. Use it to answer questions that follow.



D

a) i) Name the organ from which the above section was obtained. Give a reason for your answer (2mks)

……

……

……

ii) Structure labelled J is described as a mechanical tissue. Explain (1mk)

……

……

b) i) Name the process by which water passes across structure M (1mk)

……

ii)Explain two ways by which cells with structures Dare adapted to their functions (2mks)

……

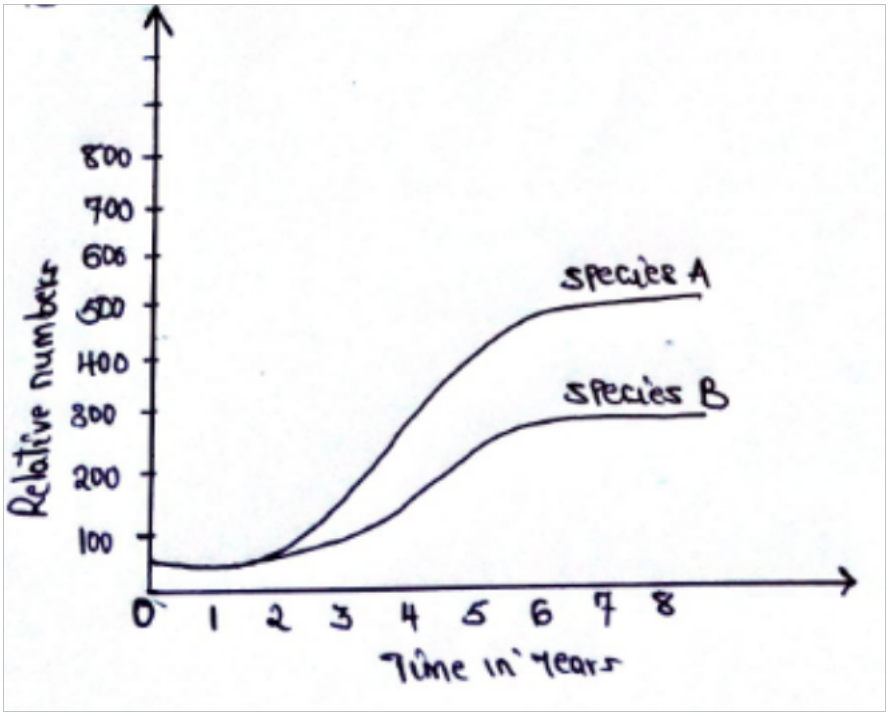
……

c) Name two strengthening materials that strengthen the collenchyma tissue (2mks)

……

……

3. The herbivorous mammalian species were introduced into an ecosystem at the same time and in equal numbers. The graph below represents their populations during the first seven years. Study the graph and answer the questions that follow.



a) i) Which species has a better competitive ability (1mk)

……

ii) Give reason for your answer (1mk)

……

……

b) Account for the shape of the curve of species A between

i) One year and three years (2mks)

……

……

……..

ii) Three years and seven years (2mks)

……

……

……

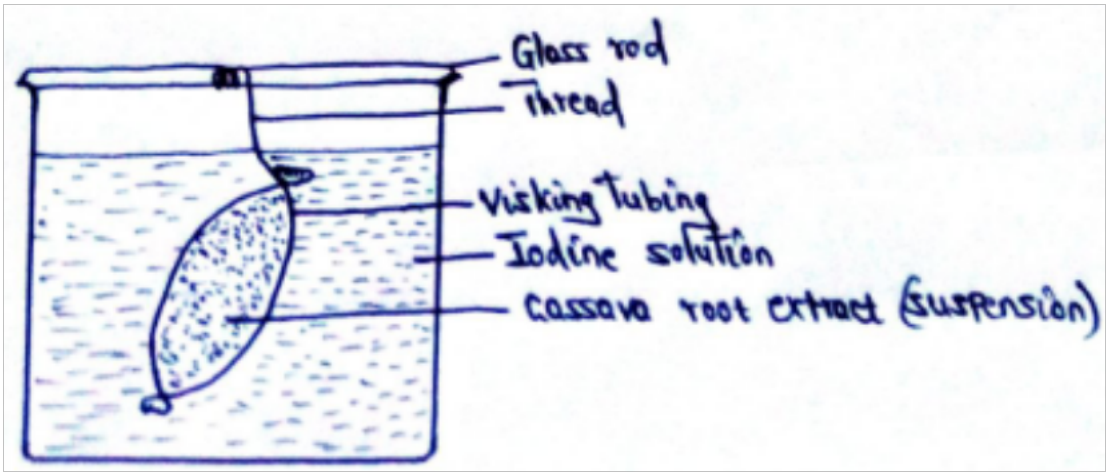
c) A natural predator for species A was introduced into the ecosystem. With a reason state how the population of each species would be affected (2mks)

……

……

……

4. A student from Abogeta secondary set up an experiment as illustrated below.



The visking tubing was left in iodine solution for 4 hours.

a) State the physiological process being investigated (1mk)

……

b) i) What were the expected results in the visking tubing and in the beaker (2mks)

……

……

……

ii)Account for your expected result in visking tubing (2mks)

……

……

……

……

c) Mention three factors that influences the rate of active transport (3mks)

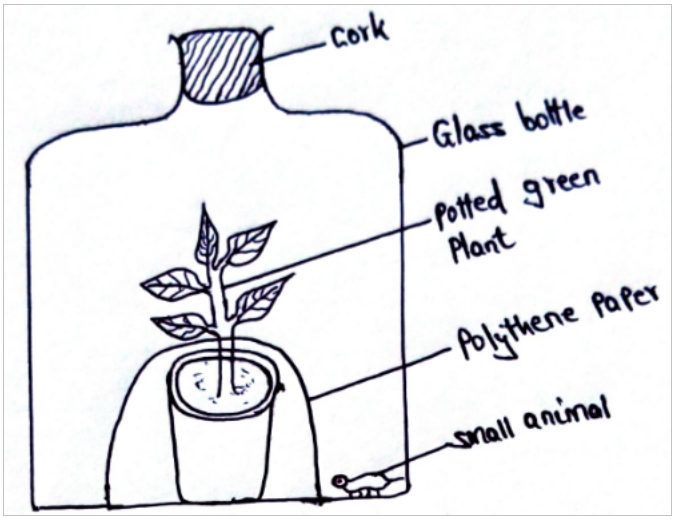
……

……

……

……

5. An experiment was set up to investigate a factor in autotrophism in green plants.



Vaseline was applied at joint between the cork and the mouth of glass bottle and set up was left under sunlight for 6 hours.

a) Why was it necessary;

i) To apply Vaseline (1mk)

……

ii) To cover the pot with polythene paper (1mk)

……

iii) What was the purpose of including the small animals? Give two reasons. (2mks)

……

……

b) i) What would happen to the small animal if the set up was left over night in darkness (1mk)

……

……

ii)Account for the answer in b (i) above (1mk)

……

……

c) State the respiratory surface of the following organism (2mks)

i) Amoeba

……

ii) Fish

……

SECTION B (40MKS)

Answer question 6 (Compulsory) and choose either question 7 or 8

6. A hungry person had a meal, after which the concentration of glucose and amino acids in the blood were determined. This was measured hourly as the blood passed through the hepatic portal vein and the iliac vein in the leg. The results were as shown in the table below.

Time (Hrs)	Concentration of contents in Hepatic portal vein (Mg/100ml)		Concentration of contents in the iliac vein of the leg (Mg/100ml)	
	Glucose	Amino acids	Glucose	Amino acids
0	85	1.0	85	1.0
1	85	1.0	85	1.0
2	140	1.0	125	1.0

3	130	1.5	110	1.5
4	110	1.5	90	3.0
5	90	3.0	90	2.0
6	90	2.0	90	1.0
7	90	1.0	90	1.0

a) Using the same axes draw graphs of concentration of glucose in the hepatic portal vein and the iliac vein in the leg against time
(7mks)

b) Account for the concentration of glucose in the hepatic portal vein from;

i) 0-1 hour (2mks)

……

……

……

……

ii) 1-2 hours (3mks)

……

……

……

……

……

iii) 2-4 hours (3mks)

……

……

……

……

……

iv) 5-7 hours (2mks)

……

……

……

……..

c) Account for the difference in the concentration of glucose in hepatic portal vein and the iliac vein between 2 and 4 hours
(2mks)

……

……

……

d) Using the data provided in the table explain why the concertation of amino acids in the hepatic portal vein took longer to increase (1mk)

……

……

……

Essays

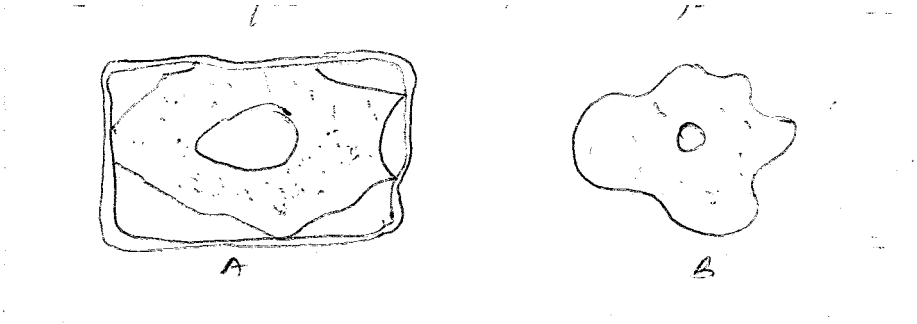
7. a) Describe the opening and closing of the stomata using the photosynthetic theory (10mks)
   b) Describe blood sugar regulations in mammals (10mks)
8. a) Describe the adaptation of the following plants to their habitat;
   i) Xerophytes (15mks)
   ii) Hydrophytes (5mks)

SAMPLE II

BIOLOGY FORM 4 PAPER 2
TIME 2 Hrs
NAME: …… ADM NO: …….. CLASS: …….

Instructions to candidates: Answer All Questions in the Spaces Provided

1. The diagram shows two types of cells placed in a certain solution. Study them and answer questions that follow



a. Name the physiological process responsible for the observed results. [1 Mark]

b. Give the correct biological term used to describe cells A & B. [2 Marks]

A –

B –

2. The equation below shows a chemical reaction that takes place in plants.

Carbon (iv) oxide + water → A + water

a. Identify substance A. [1 Mark]

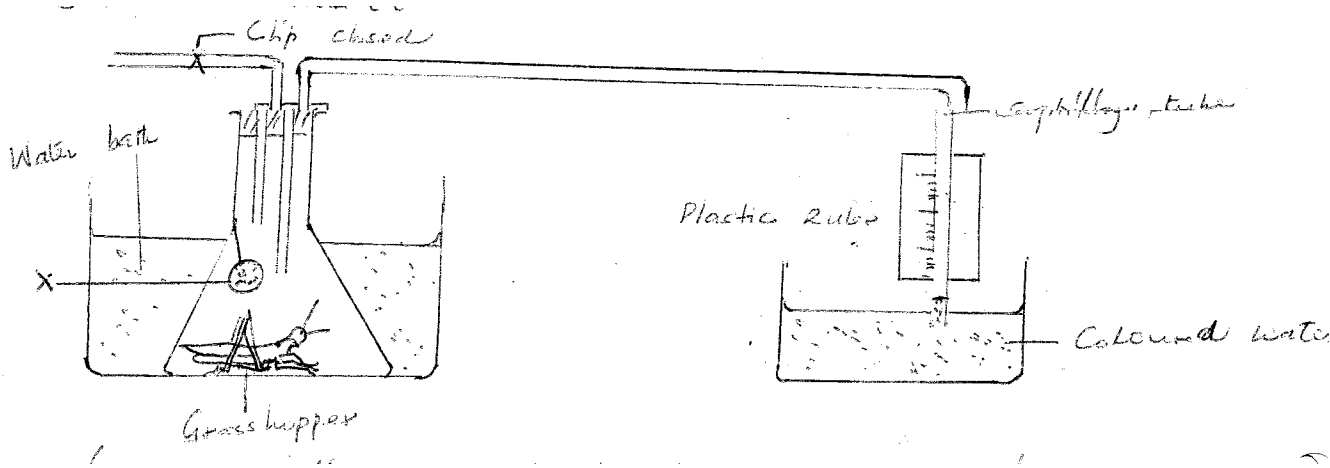
b. Name the process represented by the equation. [1 Mark]

c. Other than the reactants state **two** conditions necessary for this reaction.
[2 Marks]

i.

ii.

3. The diagram below illustrates an experiment used to determine rate of respiration in a small insect.



a. Name the chemical compound labeled X and state its function.
[2 Marks]

Compound –

Function –

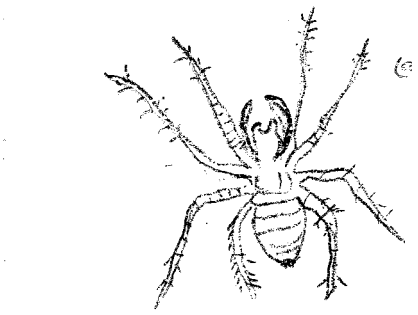
b. Why is the conical flask placed in a water bath?
[1 Mark]

c. What would happen to the level of coloured water after 5 minutes? Explain: [2 Marks]

d. How can a control experiment be set? [1 Mark]

4. In a biology lesson a student collected the animal in the diagram below.

Use it to answer questions that follow;



a. Name the phylum and class to which the organism belongs

i. Phylum _____ [1 Mark]

ii. Class_____ [1 Mark]

b. Give two reasons for your answer in 1 (i), (ii) above [4 Marks]

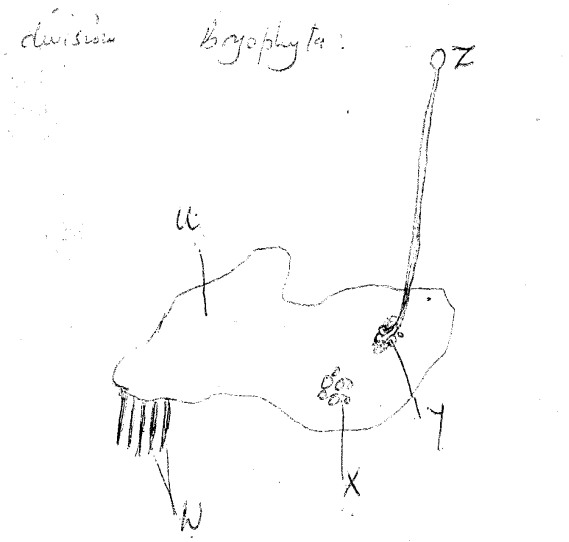
i. _____

_____

ii. _____

_____

5. The diagram below represents a plant in the division Byrophyta:



a. Name the parts labeled [5 Marks]

U

W

X

Y

Z

b. Name one function of part labeled. [3 Marks]

X

Y

Z

6.

a. It is observed that when apical bud of a plant is removed, lateral buds sprouts, where as they do not sprout in presence of the apical bud;

i. What is the biological term used to describe this? [1 Mark]

ii. Give one application of this phenomena in agriculture. [1 Mark]

b. State four roles of IAA in plant growth and development: [4 Marks]

c. In epigeal germination the cotyledon is brought above the soil surfaces; Explain

[2 Marks]

7.

a. State 2 structural modifications of nephrons in desert mammals.
[2 Marks]

b. State a kidney disease whose symptom is coloured and turbid urine
[1 Mark]

8. In a biological experiment; a cross was made between a tall pea plant & dwarfs plants; their progeny was selfed and the resulting plants were in a mixture in the ratio of 3:1. Make a biological cross to show these outcomes. [4 Marks]

9. Explain geographical distribution as evidence of organic evolution.
[2 Marks]

SECTION B

Answer Questions 10 (Compulsory) and either question 11 or 12 in the Spaces Provided

10. The table below shows the changes observed in the dry weight in milligrams of a barley seedling, its embryo and Endosperm during the first ten days after the onset of germination.

	Dry weight in milligrams		
Time (days)	Embryo	Endosperm	Whole seedling
0	2	41	45
2	2	39	43
4	7	32	41
6	15	21	38
8	22	11	35
10	35	6	43

a. Using a suitable scale and on the same axis, plot a graph of dry weight of embryo, endosperm and whole seedling against time.
[8 Marks]

b. State and account for the changes in dry weight shown by:-

i. Endosperm [4 Marks]

ii. Embryo [4 Marks]

c. Explain the role of water during germination [4 Marks]

11.

a. Describe how the mammalian heart is adapted to its function [10 Marks]

b. How does gaseous exchange take place in terrestrial plants? [10 Marks]

12.

a. How is the Epidermis of a green plant adapted to its function? [6 Marks]

b. Describe how structural factors affect rate of transpiration in plants [8 Marks]

c. Describe how xerophytes adapted to minimize water loss in their habitat. [6 Marks]