

4.5 BIOLOGY (231)

4.5.1 Biology Paper 1 (231/1)

1.	a) Lysosomes/golgi apparatus;	(1 mark)
	b) White blood cells fight pathogens to protect the body, the lysosomes contain lytic enzymes which destroy pathogens;/golgi apparatus synthesize lysosomes which contain lytic enzymes that destroy pathogens;	(1 mark)
2.	<ul style="list-style-type: none"> • Cylindrical body; • 9 – 100 segments; • Each segment has two pairs of legs; • Pair of short antennae; • Has two clumps of many simple eyes; • Has anterior genital pore/apparatus; • Has three body parts (head, thorax and trunk); <p style="text-align: center;">Any 2</p>	(2 marks)
3.	Premolars; molars;	(2 marks)
4.	a) Photosynthesis;/gaseous exchange in plants;	(1 mark)
	b) Stoma/somata;	(1 mark)
	c) Are more on the lower surface of terrestrial plants/fewer on the upper surface; to reduce transpiration;	(2 marks)
5.	<ul style="list-style-type: none"> • Cools the plant; • For uptake of water up the xylem vessels; • Mechanism through which mineral elements are transported in the plant; • Removal excess water; • Maintains turgor pressure; • 	(3 marks)
6.	(i) (Blood) plasma;	(1 mark)
	(ii) Has (more large) proteins/blood platelets; High (hydrostatic) pressure/low pressure of tissue fluid; Has red blood cells;	(2 marks)
7.	(a) Process by which living organisms/cells break down /oxidize (organic) food materials into simpler compounds to release energy;	(1 mark)
	(b) – Peristalsis; -Absorption of materials; -Chewing (movement of jaw muscles); -Churning; -Secretion of digestive enzymes Any 3	(3 marks)
8.	<ul style="list-style-type: none"> • Numerous to increase surface area through which materials diffuse; • Thin/one-cell thick/single cell epithelium/endothelium for faster diffusion; 	(3 marks)

	<ul style="list-style-type: none"> Lined with a single cell epithelium for faster diffusion; Are selectively permeable for passage of materials; Narrow lumen to maintain pressure; <p>Any 3</p>	
9.	<p>a) Gill;</p> <p>b) Fish mouth opens lowering pressure in buccal cavity and water rushes in; mouth closes increasing pressure that forces water into the gill cavity/opercular cavity; O₂ rich water flows over the gills in a counter current direction to capillary blood flow; causing O₂ to diffuse into the gill capillaries; Any 3</p>	(1 mark)
10.	<ul style="list-style-type: none"> Water; Carbon (IV)oxide; Energy/Adenosine Triphosphate; Alcohol/ethanol/ethyl alcohol; <p>Any 2</p>	(2 marks)
11.	<p>(a) Thermoregulation; Osmoregulation; Regulating salt balance;</p> <p>Any 1</p>	(1 mark)
	<p>(b) – Blood vessels/arterioles; – Hair; – Sweat glands; – Erector pili muscles; – Nerve endings</p> <p>Any 3</p>	(3 marks)
12.	<ul style="list-style-type: none"> To fit in the (limited space) in the kidney/occupy less space; Increase surface area for (selective) reabsorption; Allow for more time for (selective) reabsorption; 	(3 marks)
13.	<ul style="list-style-type: none"> Cannot be used for most animals/plants; Assumes organisms are evenly distributed; Inaccuracy (over/under-estimation); <p>Any 2</p>	(2 marks)
14.	<p>(a) Epigeal;</p>	(1 mark)
	<p>(b) Hypocotyl elongates faster than the epicotyl; pushing cotyledons above the ground;</p>	(3 marks)
15.	<p>Fish uses dissolved oxygen for gaseous exchange; gill filament epithelium dries up; gill filaments clamp together; surface area for gaseous exchange reduced; oxygen lacks moist surface for dissolution causing death(due to suffocation);</p>	(4 marks)
16.	<ul style="list-style-type: none"> Femur; Pelvic girdle; 	(1 mark) (1 mark)
17.	<ul style="list-style-type: none"> Converts carbon (IV) oxide to carbonic acid; which easily dissociates into hydrogen ions (H⁺ and hydrogen carbonates (HCO₃-for easier transportation; reducing acidity in blood; 	(3 marks)

18.	(a) Height (tallness); Long hair; Skin colour (light); Any 2	(2 marks)
	(b) Most of the genes are sex-linked and are carried on the X - chromosomes; boys receive X chromosomes from the mother (and Y chromosomes from the father); if the X carries a recessive gene, it is more likely to be phenotypically expressed in boys;	(3 marks)
19.	(a) Beak M	(1 mark)
	(b) Beak M is simple/basic; original beak; the birds separated to occupy different niches; and specialized for different diets; leading to more complex/developed beaks over time; Any 3	(3 marks)
20.	(a) Different embryonic origin but evolved to perform similar functions (due to exploitation of same kind of environment);	(1 mark)
	(b) – wings of bats and insects; -Eyes of mammals and molluscs; -Limbs of mammals and arthropods; -Flipper in whales/dolphins and fins of fish;	(2 marks)
21.	<ul style="list-style-type: none"> • Twinning around a support; • Use of tendrils/spines/thorns/hooks (to cling on nearby plants/trees); • Turgid cells (in their stems); Any 2	(2 marks)
22.	Gradual change from simple life forms to complex forms over a (long) period of time;	(1 mark)
23.	<ul style="list-style-type: none"> • Growth; and development; • Reproduction; 	(2 marks)
24.	<ul style="list-style-type: none"> • A camel is a desert animal, a longer nephron increases the surface area for reabsorption of water; to conserve it; a whale is aquatic animal, (does not need to conserve water); 	(3 marks)
25.	(a) Aestivation;	(1 mark)
	(b) Reduced metabolic activity; hence low rate of respiration; minimizing water loss/ dessication (to the environment);	(3 marks)
26.	<ul style="list-style-type: none"> • Less-toxic; • Very soluble; • A small molecule (easily filtered in the kidneys); • Requires less water to excrete; Any 2	(2 marks)

27.	<p>Mouse is active/has a large surface area to volume ratio; hence has a higher metabolic rate (rate of breathing) to cope with the rate at which energy (oxygen) is consumed or lost to the environment; an elephant is less active/has a small surface area to volume ratio hence has a lower rate at which energy (oxygen) is used or lost; <i>or</i></p> <p>Mouse is small in size/has large surface area to volume ratio; hence has a metabolic rate (rate of breathing) to cope with the rate at which oxygen is consumed/energy is lost to the environment; an elephant is large in size/has small surface area to volume ratio; hence has a lower rate at which oxygen/energy is lost;</p>	(3 marks)
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