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 parthogens;	(1 mark)
2.	• 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); **Any 2**	(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.	• 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.	• Numerous to increase surface area through which materials diffuse; • Thin/one-cell thick/single cell epithelium/endothelium for faster diffusion;	(3 marks)

	• Lined with a single cell epithelium for faster diffusion; • Are selectively permeable for passage of materials; • Narrow lumen to maintain preesure; **Any 3**	
9.	a) Gill;	(1 mark)
	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; O_2 rich water flows over the gills in a counter current direction to capillary blood flow; causing O_2 to diffuse into the gill capillaries; **Any 3**	(3 marks)
10.	• Water; • Carbon (IV)oxide; • Energy/Adenosine Triphosphate; • Alcohol/ethanol/ethyl alcohol; **Any 2**	(2 marks)
11.	(a) Thermoregulation; Osmoregulation; Regulating salt balance; **Any 1**	(1 mark)
	(b) – Blood vessels/arterioles; - Hair; - Sweat glands; - Erector pili muscles; - Nerve endings **Any 3**	(3 marks)
12.	• 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.	• Cannot be used for most animals/plants; • Assumes organisms are evenly distributed; • Inaccuracy (over/under-estimation); **Any 2**	(2 marks)
14.	(a) Epigeal;	(1 mark)
	(b) Hypocotyl elongates faster than the epicotyl; pushing cotyledons above the ground;	(3 marks)
15.	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);	(4 marks)
16.	• Femur; • Pelvic girdle;	(1 mark) (1 mark)
17.	• Converts carbon (IV) oxide to carbonic acid; which easily dissociates into hydrogen ions (H^+ and hydrogen carbonates (HCO_3-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.	• 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.	• Growth; and development; • Reproduction;	(2 marks)
24.	• 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.	• Less-toxic; • Very soluble; • A small molecule (easily filtered in the kidneys); • Requires less water to excrete; **Any 2**	(2 marks)

27.	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; ***or*** 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;	(3 marks)