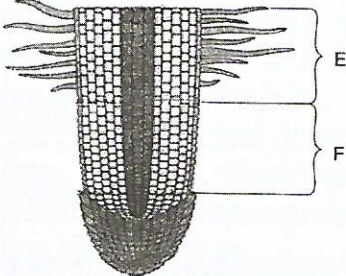
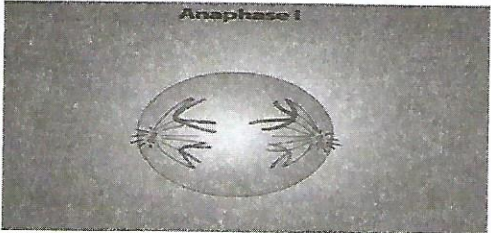


KCSE 2022 PAPER 1**5.3 BIOLOGY (231)****5.3.1 Biology Paper 1 (231/1)**

#	Marking Scheme	Marks
1.	<ul style="list-style-type: none"> Humans take longer to grow/ mature (for observations / inferences to be made); Not convenient/ cannot be caged/ contained (under some set experimental conditions); It is unethical; OWTTE 	(2 marks)
2.		(2 marks)
3.	<ul style="list-style-type: none"> Burning of carbon in inadequate supply of air/oxygen; (Excessive) supply/emission of carbon (II) oxide (exhaust fumes/burning <i>jiko</i>); <p>(b) Carboxyhaemoglobin is a stable compound/ does not dissociate/break; haemoglobin is not free/released to transport the oxygen; resulting in suffocation/ death;</p>	(2 marks)
4.	<p>(a) To accommodate varied volumes of air/respiratory gases (during the breathing process);</p> <p>(b) Shock absorber/ shield the (delicate) lungs against mechanical damage/friction (with ribs/ adjacent bones);</p>	(1 mark)
5.	<p>(a) <i>Monera</i>;</p> <p>(b)</p> <ul style="list-style-type: none"> No membrane-bound organelles/fewer organelles; No definite nucleus/prokaryotic/primitive nucleus; Presence of flagella; Unicellular; 	(1 mark)
		(2 marks)

#	Marking Scheme	Marks
6.	(a) <ul style="list-style-type: none"> (i) Egg cell; (ii) Integuments; (b) Testosterone;	(1 mark) (1 mark) (1 mark)
7.	(a) A population is a group of organisms of the same species co-existing/living together in a particular habitat while a community is a group of plant and animal/different species living together in a given habitat;	(1 mark)
	(b) Herbicides (gradually) accumulate in food chains (plant/ animal tissues) which when fed on by human beings slowly accumulate in human tissues (when inhaled/come in contact with the body) causes diseases/poisoning/ affecting the working of some body organs/systems/some are carcinogenic/cause death;	(1 mark)
	(c) <ul style="list-style-type: none"> • Elimination of wastes/ excretion/defecation/urination; • Decomposition of organic matter/unconsumed parts of organisms; • Through respiration; 	(2 marks)
8.	(a) (A pair of) forceps;	(1 mark)
	(b) Picking up/holding specimens;	(1 mark)
9.	(a) <ul style="list-style-type: none"> • Incomplete/partial breakdown/ oxidation of substrates; • Inadequate/ shortage of oxygen; 	(2 marks)
	(b) <ul style="list-style-type: none"> • Fats are insoluble in water hence not easily transported to body tissues; • Fats require more oxygen to be oxidized; 	(2 marks)

#	Marking Scheme	Marks
10.	(a) (i) Iodide ion (I ⁻);	(1 mark)
	(ii) The uptake of I ⁻ is done by active transport; which is respiration/energy-dependent which when inhibited consequently affects/impairs the active transport process which is responsible for the uptake of the ions;	(2 marks)
	(b) The visking tubing being semi-permeable; allowed selective passage of the iodine molecules into it; which react with starch to form a blue-black colour/ starch molecules are bigger than iodine-could not pass out through the pores into the beaker;	(2 marks)
11.	(a) (i) Metaphase I;	(1 mark)
	(ii) Spindles have formed/ bivalent pair of chromosomes aligned at the equator/homologous chromosomes align at the equator;	(1 mark)
	(b)	(1 mark)
		
	(b) (Inbreeding) hampers variation; resulting in the propagation of undesired genes (some of which might be weaker/ lethal), to subsequent generations;	(2 marks)
12.	They have a large surface area to volume ratio; diffusion (across its cell membrane) is sufficient for its gaseous exchange needs;	(2 marks)
13.	Number of cells in the field of view = 6 Diameter of field of view = 1.5 mm; Size of each cell (in the field of view) = $\left(\frac{1.5}{6} \times 1000\right) \mu\text{m}$ = 250 μm ;	(2 marks)

#	Marking Scheme	Marks
14.	(a) Ribosomes;	(1 mark)
	(b) Golgi bodies/apparatus/smooth endoplasmic reticulum;	(1 mark)
15.	<ul style="list-style-type: none"> • Amoeba; • Paramecium/Paramecia; • Trypanosoma; • Spirogyra; • Euglena; • Chlamydomonas; 	(2 marks)
16.	(a) The distance/ space for manipulation on the stage is limited; to avoid crushing the slide/ specimen;	(2 marks)
	(b) Total magnification = Eye piece lens × objective lens power; =10 × 75 =×750;	(2 marks)
17.	A goat is a browser (mainly feeds on shrubs/leaves) while a sheep is a grazer, (mainly feeding on grass); there is no competition for (the critical common resource) food needed for their survival;	(2 marks)
18.	(a) (i) Joint G- Hinge joint;	(1 mark)
	(ii) Joint H- Gliding/sliding joint;	(1 mark)
	(b) (To form firm strong joints so as) to protect the (delicate) brain enclosed therein;	(1 mark)
19.	(a) There was a greater decline in the number of white mice compared to the black ones; the white mice were selected against (by nature); they did not camouflage (well) with the surroundings because of their bright white colour/ could easily be seen by the jackals/predators unlike the black mice;	(3 marks)
	(b) (Charles Darwin's theory of) natural selection;	(1 mark)
20.	(a) Auxins/ Indole-Acetic Acid;	(1 mark)
	(b) The substance caused faster division/elongation of cells on the side it was applied; giving rise to faster growth compared to the opposite side; resulting in a curvature/ bending away from the side where it was applied;	(3 marks)

#	Marking Scheme	Marks
21.	(When the blood water level is below normal), the body is dehydrated; more antidiuretic hormone (ADH) is secreted the antidiuretic hormone stimulates the kidney tubules (distal convoluted tubule/ collecting ducts); increasing their permeability to water; water is reabsorbed into the bloodstream until the osmotic balance is attained;	(3 marks)
22.	(a) Oxygen; (b) More gas was produced at pH 9.2 (higher pH); this basic/ alkaline pH; was favourable for the optimal working of the enzyme (catalase) in the irish potatoes; lower pH/acidic medium (4.2) did not favour the optimal working of the enzyme;	(1 mark) (3 marks)
23.	(a) <i>Trichomonas vaginalis</i> ; (i) Propel the ovum/zygote/sperm into the oviduct/ fallopian tube; (ii) Trap solid/dust particles in the inhaled air; (b) Wind;	(1 mark) (1 mark) (1 mark) (1 mark)
24.	(a) 75 ± 1 ; (b) The population increased exponentially; because the organisms had adjusted to the environment; conditions were favourable (for reproduction/breeding); there was adequate food/ water/ space/no competition (for resources); there were no diseases; more reproduced/ fewer deaths;	(1 mark) (3 marks)
25.	(a) Aquatic/fresh water/swampy/marshy environment; (b) Broader leaf surfaces; to increase the surface area for the loss of excess water; the broad surfaces have more stomata on the upper leaf surfaces to enhance loss of excess water; presence of shallow roots to minimize absorption of water; flowers raised above the water surface to enhance pollination; broad leaf surfaces for buoyancy;	(1 mark) (3 marks)