KITUI COUNTY MOCK
END OF TERM II FORM FOUR EXAMINATION, 2017
Kenya Certificate of Secondary Education (K.C.S.E)
231/1
BIOLOGY
PAPER 1
MARKING SCHEME

1. Living organisms unlike motor vehicles, show the following characteristics; reproduction, growth and development, irritability / sensitivity, respiration, gaseous exchange and nutrition.
Any 3 points (3 marks)

2. a) Sucking small insects / small animals from rock surfaces and bark of trees. (1 mark)
b) Attracting and trapping small crawling animals. (1 mark)

3. a) Site for protein synthesis; (1 mark)
b) Contains lytic enzymes that destroy the worn our cells / organelles / entire cell. (1 mark)

4. a) Moves the body tube through smaller distances to bring image into sharp focus; (1 mark)
b) Is the platform where specimen on the slide is placed; (1 mark)

5. to enable easy manipulation or positioning of specimens as wetness causes the slide with the specimens to stick onto the stage; (1 mark)

6. Length of one cell = $\frac{Diameter\ of\ the\ field\ of\ view}{Number\ of\ cells}$ (μm)

$= \frac{6000\,m}{55\,cells} = 109.09$

$\cong$ 109.1 μm (2 marks)

7. a) The visking tubing will become swollen / bigger / enlarged / increase in size / turgid; (1 mark)
b) Sucrose solution is hypertonic compared to the water in the beaker (or water is hypotonic compared to sucrose in the beaker); water moves from the beaker into visking tubing by osmosis through semi-permeable visking tubing; making the visking tubing to swell or to increase in size; (3 marks)

8. a)

Diffusion	Active transport
- Molecules move from a highly concentrated region to a lowly concentrated region;	- Molecules move from a lowly concentrated region to a highly concentrated region;
- Movement of the molecules is along a concentration gradient;	- Movement of molecules is against a concentration gradient;
- No energy is required;	- Energy is required;
- Does not require protein carrier molecules	- Requires protein carrier molecules

Any 2 marks

b) i) - Absorption of water from the soil by root hair cells;
- Opening and closing of the stomata;
- Support in herbaceous plant due to the turgidity of the cells;
- Feeding in insectivorous plants;

Mark first one point

ii) - Water reabsorption by blood capillaries from renal lubules / absorption of water in colon or gut;
- Movement of water from cell to cell in animals;

Mark first one point

9. Nitrogen; Magnesium; iron *Mark first two points*

10. a) To increase the respiratory enzymes hence increasing the rate of respiration. (1 mark)

b) i) Stroma; (1 mark)

ii) - Bearing photosynthetic pigments or chlorophyll molecules hence site for light dependent reaction where light is trapped for photolysis;
- It provides a large surface area for maximum chlorophyll hence photolysis;

(*Any* 1 mark)

11. Hydrogen ions; Oxygen gas; ATP (*Any* 2 marks)

12. a) They activate the enzymes (1 mark)

b) Iron (Fe^{2+}); magnesium (Mg^{2+}); Zinc (Zn^{2+}); Copper (Cu^{2+}); Calcium (Ca^{2+}) *(Mark first one point)*

13. In the stomach there is acidic medium due to presence of hydrochloric acid (HCl) and ptyalin only acts at slightly alkaline medium hence it is denatured or destroyed by a low pH; (1 mark)

14. - Source of energy when oxidized;
- Act as storage materials;
- For structural compounds;

Mark first two points

15. a) Xylem; (1 mark)

b) Phloem tissues; (1 mark)

c) Apical meristems; (1 mark)

16. a) Cohesion force enables the water molecules to stick together in a continuous column in the vessels since water molecules attract one another; (1 mark)

b) Adhesion force enable water molecules to stick or get attracted to the vessel walls hence water rises up the vessels; (1 mark)

17. a) Open circulatory systems; (1 mark)

b) i) Hepatic portal vein; (1 mark)

ii) Pulmonary vein; (1 mark)

18. a) - Thrombosis (Coronary thrombosis)
- Varicose veins;
- Hypertension;
- Arteriosclerosis;

Mark first one point

b) - Have biconcave in shape to increase the surface area for packaging of more haemoglobin hence absorption of gases;
- Absence of nucleus to increase surface area for packaging of haemoglobin;
- Presence of red pigment (haemoglobin) that has high affinity for oxygen;
- Ability to change their shape thus can squeeze through narrow capillaries

Mark first two points

NOTE: Feature must be followed by a reason

19. Carboxyhaemoglobin is a very stable compound that does not easily dissociate; therefore reduces the capacity of haemoglobin to transport oxygen to the tissues; (2 marks)

20. - Thin wall / thin epithelium for faster diffusion of the respiratory gases / reduces the diffusion distance fir diffusing molecules;
- Always moist for respiratory gases to dissolve and diffuse in solution form;
- Large surface area for maximum diffusion / gaseous exchange;
- Highly vascularized to maintain a steep concentration gradient;

(4 marks) **NB:** Feature must be accompanied by reason

21. i) <u>Bordetella pertussis</u>; (1 mark)

ii) <u>Streptococcus pneumoniae</u> (1 mark)

22. - Ethanol / Ethel / Ethanoic acid / Alcohol;
- Carbon (IV) oxide;
- Energy (ATP);

(3 marks)

23. Body size;
Sex;
Age;
Basal metabolism rate;
Activities / every day's activities;

Mark first two points

24. Muscles respire anaerobically; resulting in accumulation of lactic acid in the tissue, causing fatigue / muscle crumps / pain. Since lactic acid is toxic, it must be broken down into carbon (IV) oxide and energy; therefore extra oxygen must be taken in to oxidise lactic acid; (2 marks)

25. i) Diabetes insipidus; (1 mark)
ii) Antidiuretic hormone (ADH); (1 mark)

26. - Cools the body when latent heat of vaporization is carried away;
- Gets rid of waster / materials of excretion e.g urea, sodium chloride, uric acid, lactic acid;
- Contains antiseptic properties therefore kills the micro-organisms in the skin;

Any 2 marks

27. The amino acids are broken down into amino group (NH_2) and carboxyl group (COOH), a process referred to as deamination;
The amino group combines with hydrogen forming highly toxic ammonia; which immediately goes into ornithine cycle where it combines with carbon (IV) oxide forming urea that is less toxic that is removed by the kidneys; the carboxyl group is converted to glucose / carbohydrates and then oxidized to yield energy or is converted into neutral fats and deposited in adipose tissue; (3 marks)

28. - Some waste products are stored in non-toxic form in leaves, flowers, fruits and old bark which age and drop off;
- Some waste products such as oxygen are reused or recycled;
- Some waste products are formed slowly thus little accumulation of wastes;
- Some wastes e.g gases easily diffuse out of the plant tissues;
- Some waster products are mainly made from carbohydrate and hence are not as harmful as proteinous materials;
- Plants are less active;

(4 marks)

29.

Chilopoda	Diplopoda
- A pair of walking leg per segment	- 2 pairs of walking legs per segment
- Body flattened dorsoventrally	- Body cylindrical in shape
- Body divided into head and trunk (2 body parts)	- Body divided into head, thorax and trunk (3 body parts)
- Have long antennae	- Have short antennae
- Have poisonous claws	- Lack poisonous claws
- Posterior genital aperture	- Anterior genital aperture

30. a) - Numerous chloroplasts that are highly sensitive to trap light of low intensity;
- Deeply dissected leaves into straws to increase surface area hence trap more light and more gases;
- Large air spaces for storage of air hence buoyancy and parenchyma tissue for storage of air;
- Have no cuticle to facilitate exchange of gases rapidly;

Any 2 marks

b) Albinism;
Sickle cell anaemia;
Haemophilia;
Colour blindness

Mark first two points

31. a)

Rods	Cones
- Perceives light of low intensity - Not sensitive to colour - Have low visual acuity since they have retinal convergence	- Perceives light of high intensity - Sensitive to colour - Have high visual acuity since they lack retinal convergence

Mark first two points

b) - Supports or protects the delicate inner parts against mechanical injury or infections;
- Prevents drying out of organism / desiccation since it is waterproof;
- Provides surface for attachment of the muscles;

Mark first one point