BUKAKA CLUSTER EXAMINATIONS

231/1

BIOLOGY PAPER 1

MARKING
SCHEME

END OF TERM 1, 2025

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

- Write your **name and index** number in the spaces provided above.
- Answer **ALL** questions in the spaces provided above.
- All workings must be clearly shown where necessary.

Question	Maximum score	Candidate score
1 - 30	80	

This paper consists of 9 printed pages.

Candidates should check the question paper to ensure are printed and no questions are missing.

1. Name the main target organ of the following hormones: (2mks)
   (a) Antidiuretic
   - Kidney
   (b) Glucagon (1mk)
   -Liver
2. (a) What is Binary Fission? (1mk)
   It's a form of asexual reproduction which involves the splitting of the original cell into two similar daughter cells.
   (b)Give two disadvantages of sexual reproduction. (2mks)
   (i) Variations due to gene mixing may result in undesirable qualities.
   (ii) Fewer offsprings are produced at a time.
   (iii) It involves two organisms that must mate
3. A sucrose solution was boiled with hydrochloric acid. Sodium hydrogen carbonate was added and the mixture heated with benedict's solution. An orange precipitate was formed.
   (a) Why was the solution boiled with hydrochloric acid? (1mk)
   To hydrolyse sucrose which is a non-reducing sugar to a reducing sugar.
   (b) To which class of carbohydrates does sugarcane belong? (1mk)
   Disaccharides
   (c) Name the type of reaction that takes place when:

Simple sugars combine to form complex sugar. (1mk)
Condensation

(d) State the form in which carbohydrates are stored in animals. (1mk)
Glycogen.

4. (a) State **two** ways in which blood clotting is important to a human being. (2mks)
   - **Prevents further loss of blood/bleeding.**
   - **Prevents entry of pathogens**
   - **Leads to the healing of the wound.**

   (b)What are the roles of thrombokinase enzyme during blood clotting? (2mks)
   - **Neutralize heparin (anticlotting factor)**
   - **Activate the conversation of prothrombin to thrombin.**

5. In an experiment, Venna counted 9 cells along the diameter of field of view of a light microscope measuring 3.0mm. Determine the diameter of one cell in micrometers. (3mks)

   Cell diameter = $\frac{\text{Diameter of field of view in microns}}{\text{No. of cells}}$
   1 mm = 1000µm
   Cell diameter = $\frac{3000}{9}$ = 333 µm

6. (a) Name the hormone that stimulate the maturation of the Graafian follicles to release a mature ovum in female reproductive cycle. (1mk)
   Luteinising hormone (rej. LH)
   (b)Explain why menstruation does not take place after fertilization in human beings. (2mks)
   The level of progesterone increases; inhibiting FSH from stimulating the maturation of another Gracifian follicle; and corpus luteum does not disintegrate;

7. Name the branch of biology that involves the study of:
   (a) Organisms for the sake of classifying them. (1mk)
   Taxonomy
   (b) Microscopic organisms (1mk)
   Microbiology

8. (a) Photosynthesis takes place in two stages. Name the part of chloroplast where the light stage occurs. (1mk)
   Granum (acc Grana)
   (b)How is the dark stage dependent on the light stage of photosynthesis. (2mks)
   - Uses the hydrogen atoms that are produced by splitting of water molecules; in light stage;
   - Energy required for this stage is provided by ATP from the light stage.

9. The illustration below represents the base sequence for a section of a nucleic acid.

a) (i) Identify the nucleic acid whose is represented by the illustration. (1mk)
   - **Ribonucleic acid (RNA)**

   (ii)Give a reason for your answer in (a) (i) (1mk)
   - **Thymine has been replaced by the base uracil.**

b) Name the part of the cell where the section of the nucleic acid shown would be used. (1mk)
   - **Ribosome**

10. The diagram below shows part of the gaseous exchange system of a given animal.

a) What is the importance of the bands of chitin observed in the part labelled M? (1mk)
   - **To keep the tubes open/prevent m from collapsing**

b) How is the part labelled N adapted to its function? (2mks)
   - **Thin walled to reduce the distance traveled by gases hence faster diffusion.**
   - **Moist to dissolve/allow them diffuse in solution form.**
   - **Numerous/many to provide large surface area across which large amount of gases diffuse.**
   - **Lacks spiral bands of chitin to increase the surface area for gaseous exchange.**

11. Explain how the human sperm cell is structurally adapted to perform its function. (2mks)
   - **The head contains a large haploid nucleus which carries genetic material.**
   - **Long tail which lashes side by side to propel the sperm forward.**
   - **Middle piece contains numerous mitochondria which provide energy for the propulsion of the sperm to reach the egg.**
   - **The short neck has centrioles for controlling axial filaments.**
   - **Head contain a large haploid nucleus which carries genetic materials.**

12. Name **two** mechanism that hinder self-fertilization in flowering plants. (2mks)
   - **Monoecism**
   - **Protandry**
   - **Protogyny**
   - **Self-sterility or incompatibility.**
   - **Dioecism**
   - **Heterostyly**

13. Give **three** functions of diffusion in living organism. (3mks)
   - **Absorption of materials.**

- **Gaseous exchange in plants and animals**
- **Excretion of nitrogenous wastes.**

14. Give two ways in which seed dormancy benefit a plant. (2mks)
    - **Provide the seeds with enough time for dispersal so that they can germinate in a suitable environment.**
    - **Provide time for the embryo to develop until favourable conditions are available.**
    - **Enables seeds to survive during adverse environmental conditions without depleting their food reserves.**
15. The following is part of a kidney nephron.

Name:

(i) Name the process represented by the arrows; (1mk)
Ultra-filtration

(ii) Name the conditions necessary for the process named in (a) (i) above to take place. (1mk)
High pressure in the glomerulus

(iii) Identify vessel A. (1mk)
Afferent arteriole

16. State **two** characteristics features of members of division bryophyta. (2mks)
    - **They are thalloid**
    - **Lack of a vascular transport system.**
    - **Contain chlorophyll hence photosynthetic**
    - **Develop rhizoids for anchorage absorbing water and dissolved mineral salts.**
17. (a) Give the roles of the following in the stomach.
    (i)Hydrochloric acid (1mk)
    - **Provides acidic medium suitable for action of pepsin rennin enzymes.**
    - **Kills any bacteria which may be present in food.**
    - **Converts inactive forms of rennin and pepsin into active forms.**

    (ii)Mucus (1mk)
    - **Protects stomach walls against corrosion by hydrochloric acid and digestive acid and digestive enzymes.**

    (b)Name the glands that secrete enzyme pepsin and renin in the stomach. (1mk)
    - **Gastric glands**
18. (a) Give two functions of the liver. (2mks)

- **Regulation of blood sugar**
- **Thermoregulation**
- **Regulation of plasma proteins**
- **Deamination**
- **Detoxification**
- **Haemoglobin regulation**

(b)Explain why insulin is not administered orally. (1mk)

- **Its a protein and can be digested by proteases.**

19. (a) What is blood transfusion? (1mk)
    - **Transfer of blood from a donor to the circulatory system of the recipient.**

    (b)State one factor to consider during blood transfusion. (1mk)
    - **Blood group**
    - **Age of the donor**
    - **State of health of the donor.**

20. (a) Give one difference between aerobic and anaerobic respiration. (1mk)

Aerobic	**Anaerobic**
-Oxygen required	**-Oxygen not required**
-Occur both in cytoplasm and mitochondria	**-Occurs only in cytoplasm**
- Substrate completely broken down	**-Substrate not completely broken down**
- High amount of energy released	**- Low amount of energy released**

    (b)Give two importance of respiration quotient. (2mks)
    - **Show the type of substrate oxidized.**
    - **Show the type of respiration taking place.**

21. Name the organisms involved in the following processes.
    (i) Nitrification (1mk)
    - **Nitrosomonas**
    - **Nitroccus**

    (ii) Denitrification (2mks)
    - ***Pseudomonas denitrificans***
    - ***Thiobacillus denitrificans***

22. Study the diagram below and answer the questions that follows;

a) Name the Organelle (1mk)
Rough endoplasmic reticulum

b) State function of the structure labelled A. (1mk)
- **They form sites for proteins synthesis.**

23. What is the meaning of the following terms as used in ecology. (2mks)
    (i) Autecology

Study of a single species

(ii) Synecology

- **Study of many species.**

24. (a) State two functions of an ovary in a human female. (2mks)
    - **Produces eggs or ova.**
    - **Produce female hormones.**

    (b)State two advantages of internal fertilization in mammals. (2mks)
    - **Number of eggs produced are fewer because there are higher chances of fertilization.**
    - **Higher protection of the gametes and fertilized eggs.**

25. The diagram below shows a transverse section of a plant organ;

a) Name the plant organ from which section was obtained. (1mk)
    - **Stem.**

b) (i) Name the class of the plant from which the plant organ was obtained. (1mk)
    - **Monocotyledonae (rej. Monocot)**

    (ii)Give a reason for your answer in (b) (i) above. (1mk)
    - **Vascular bundles are scattered within the ground tissue.**
    - **Lack pith**
    - **Lack cambium**

c) Name the part labeled x. (1mk)
    Epidermis

26. The reaction represented by the equation below occurs in the body.

$$\text{Hydrogen peroxide} \xrightarrow{\text{Enzyme Y}} \text{Oxygen + Water}$$

a) Name enzyme y (1mk)
    Catalase

b) Name an organ in the body where the reaction occurs. (1mk)
    Liver

27. The graph below represents the growth of animals in a certain phylum. Study it and answer the questions that follow;

a) Name the type of growth pattern shown on the graph (1mk)
    - **Intermittent growth**

b) Identify the process represented by letter B. (1mk)

- **Moulting/ecdysis**

c) Name the hormone responsible for the process in (b) above. (1mk)
- **Moulting hormone or ecdysone**

28. State the category of variation into which the following traits fall. (2mks)
(i) Skin pigmentation (1mk)
- **Continuous**

(ii) Blood group (1mk)
- **Discontinuous**

29. Distinguish between hypogeal and epigeal germination. (2mks)
Hypogeal is a type of germination where cotyledons remain underground during germination while in epigeal germination the cotyledons are brought above the soil surface.

30. State the economic importance of the following metabolic wastes from plants. (2mks)
(i) Papain
- **Used as a meat tenderizer**

(ii) Tannin
- **Used in leather treatment**
- **Used in making ink.**