INSTRUCTIONS TO CANDIDATES

❖ Answer ALL questions in this paper in the spaces provided.
❖ Additive pages must not be inserted.
❖ Candidates may be penalized for false information.
1. Account for the differences in thickness of cell walls of a guard cell. (2mks)

2. Below is a diagram showing parts of a synapse observe and other the questions that follow.

![Diagram of a synapse]

(a) Name the parts labeled: (2mks)
A. .................................................................................................................................
B. .................................................................................................................................

(b) What is the role of part labeled C. (1mk)
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3. State four ways by which the structure of phloem is adapted to its function. (4mks)
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4. Name the two nucleic found in a mature pollen grain. (2mks)
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5. (a) What is a food web? (2mks)
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(b) State two methods that you could use to approximate a population of grass in a field. (2mks)

6. (a) State the name of a graph showing growth in an insect. (1mk)

(b) The diagrams below show the results obtained in an experiment on growth of a bean seedling.

(i) State the aim of the experiment. (1mk)

(ii) State the process that takes place at each of the regions labeled A, B and C. (3mks)

7. Define the term Sex-linked characteristics and name one characteristic that is Sex-linked in Man. (3mks)

8. (a) State the function of the ear ossicles. (1mk)

(b) What is the name of the fluid found in the cochlea? (1mk)
9. **What name** is given to the tissue that joins? (2mks)
   (a) Bone to bone?
   
   
   (b) Muscle to bone?
   
   
10. **The diagram** below represents an organism in the lower levels.

   ![Diagram](image)

   (a) **In which** Kingdom does the organism belong? (1mk)

   

   (b) **Name** the structure labeled A and state its function. (1mk)

   

11. Bony fishes have streamlined body and have a lateral line. **Give** a reason why they have these characteristic Features. (2mks)

   

12. **Briefly explain** why active transport rate increases when oxygen concentration is increased in water plants. (2mks)

   

13. A man had an accident and he lost balance and memory. **Name** the part of the brain that might have been damaged. (2mks)

   

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14. In cold weather Kittens feed frequently than adult cats. **Give** a reason for this observation. (2mks)

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15. (a) The tracheal have a liquid at the endings. **State one** reason for this. (2mks)

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(b) **Why** is the skin of amphibians like frogs highly folded? (2mks)

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16. **Distinguish** between diabetes insipid us and diabetes mellitus. (2mks)

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17. The diagram below represents the structure of a leaf.

[Diagram of a leaf with multiple leaflets]

**Identify** the leaf represented in the diagram. (1mk)

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18. When raw sea wage is disposed in a river the population of mobile aquatic animals reduce down the river. **Briefly explain** the effect of raw sea wage on the population of aquatic animals in the river. (2mks)

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19. When a mammal feeds on a heavy protein meal, the liver starts being overworked immediately the soluble products of protein digestion are absorbed.

(a) **Name** the process that takes place in the liver. 

(b) **Explain** the process in Q 19 (a) above and name the products formed.

20. **Name** the organelles that would be present in large numbers in the following tissues.

(a) Actively photosynthetic tissue.

(b) A secreting tissue.

21. **Explain** how the rate of transpiration is affected by the following factors.

(a) Size of leaf.

(b) Relative humidity.

22. **Identify two** features that adapt the stomach of man to its functions.

23. **State two** advantages of a closed circulatory system over an open circulatory system.
24. A hemophiliac man married a carrier woman and had four offspring. **What** is the probability the fifth born shall be a hemophiliac son. (1mk)

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25. The diagram below is a structure of a unicellular organism Y and X are arrows showing direction of movement of soluble materials.

![Diagram of a unicellular organism with arrows X and Y]

Name the substances represented by X and Y. (2mks)

X

Y

26. **Briefly describe** how water moves to the root xylem from the root hair cells. (2mks)

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27. An athlete who was preparing for a marathon decided to prepare on a high altitude Zone. He chose to climb up a mountain where he stayed practicing for a month. Name the changes that occurred in the circulatory and gaseous exchange systems of the athlete. (3mks)

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28. The first HIV/ AIDS patient was discovered in Kakamega general hospital in 1982. Since then the number of victims has risen to thousands. Name the ways that HIV/ AIDS has been spread. (3mks)

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29. **Give three** events that follow a flower after fertilization. **(3mks)**

30. A DNA strand with the following base sequence was used in the formation of RNA.

   G- A- T- C- A- G.

   (a) **Give** the base sequence on the **RNA**. **(1mk)**

31. (a) **Define** the term Binomial nomenclature. **(1mk)**

   (b) **Name two** rules used in Binomial nominative. **(2mks)**

32. **State three** adaptations of erythrocytes that make them to fulfill the functions. **(3mks)**

33. **State** the functions of human lungs. **(2mks)**