INSTRUCTIONS TO CANDIDATES

Answer ALL questions in this paper in the spaces provided.

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This paper consists of 8 printed pages. Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

1. (a) **Name three** characteristics of living organisms (3mks)

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(b) Apart from Plantae and Animalia, name three other kingdoms. (3mks)

2. **Give two** characteristics that distinguish scientific names from common names. (2mks)

3. **State two** limitations of using a microscope to estimate the size of cells (2mks)

4. (a) **What** is cell specialization (1mk)

(b) Name three types of tissues found in animals (3mks)

5. **Distinguish** between osmosis and active transport. (2mks)


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6. **Describe** what happens during the dark stage of photosynthesis  
(3mks)

7. The diagram below shows dentition of a dog

(a) (i) Name the part labeled X  
(1mk)

(ii) Give a reason for your answer in a (i) above  
(1mk)

(b) **State** how part labeled Y is adapted to its function.  
(1mk)

8. **State** the condition to which the body of a mammal use proteins as a source of energy.  
(1mk)

9. **State two** functions of chloride ions in the human body.  
(2mks)
10. **Explain** how sunken stomata lowers the rate of transpiration (2mks)

11. The chart below is a summary of the blood clotting mechanism in man.

![Blood Clotting Diagram]

**Name**

(i) the blood cell represented by B (1mk)

(ii) the metal ion represented by A (1mk)

(iii) the end-product of the mechanism represented by C (1mk)

12. How does the heart increase blood flow to some parts of the body during strenuous exercise (2mks)
13. Name two sites where gaseous exchange takes place in higher plants (2mks)

14. State four adaptations of respiratory surfaces (4mks)

15. Give the formula for calculating the respiratory quotient (RQ). (1mk)

16. State the economic importance of the following plant excretory products
   (a) Caffeine (2mks)
   (b) Quinine (1mk)

17. Explain why a baby loses more heat per unit weight than an adult when exposed to the same environmental conditions. (2mks)
18. During a field trip, a plant with flowers caught the attention of a student.

(a) **Name** the division of the plant. (1 mark)

(b) **Suggest three** possible characteristics one would notice to conclude that it was pollinated by insects. (3 marks)

19. **State two** roles of green plants in a fish aquarium other than providing food for the fish. (2 marks)

20. Bivalent, synapsis, and crossing over are terminologies used in cell division.

(a) **Name** the stage of meiosis in which the above process occur. (1 mark)

(b) **Distinguish** between synapsis and crossing over. (2 marks)

21. **(a) State** the role of the following structures.

(i) Placenta. (2 marks)
22. **Name** the parts of the flower that are responsible for production of gametes (2mks)

23. During germination and early growth, the dry weight of endosperm decreases while that of the embryo increases. **Explain** (2mks)

24. **Give two** reasons why cross breeding is better than inbreeding (2mks)

25. **Identify** each of the following aspects of evolution described below.
   (i) Structures that have become functionless in the course of evolution. (1mk)

   (ii) A gradual continuous and irreversible change in organisms over long period of time resulting in the formation of new species from pre-existing ones. (1mk)
(iii) The evolutionary phenomenon in which organs from common ancestral forms became adapted to different ecological niche. (1mk)

26. An experiment was carried out to investigate a growth response in a bean seedling as illustrated in the diagrams below.

(a) **What** type of response was being investigated? (1mk)

(b) **Explain** the response exhibited by the root (3mks)

27. The diagram below shows surface of a human brain.
(a) **Name** the parts labelled A and C  
A:  
……………………………………………………………………………………………………  
……………………………………  
C:  
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(b) **State** what would happen if the part labeled B was damaged  
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28. **How** are xylem vessels adapted for support  
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29. **State three** characteristics of skeletal muscles  
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30. **Name three** types of harmful drugs used in society  
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