**Name: …………………………………………………… ADM No………………**

Class……………………………….Date: ……………………………………………

231/1

**BIOLOGY FORM THREE.**

Paper 1

**Time: 2 Hours**

**INSTRUCTIONS TO CANDIDATES:**

* Write**your name** , **ADM Number** and **CLASS** in the spaces provided above.
* Answer **all** the questions in this question paper.
* Answers **must** be written inthe spaces provided in this booklet.
* All answers must be written in English
* This paper consists of 14 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

**EXAMINER’S USE ONLY**

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| --- | --- | --- |
| **Question**  | **Maximum score** | **Candidate’s score**  |
| 1. 30
 | 80 |  |
|  |  |  |

1. What do the following branches of Biology deal with? (2marks)

 (a) Cytology

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 (b) Entomology

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2. State TWO characteristics of kingdom Monera that are not found in other kingdoms. (2marks).

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3. Two species in an ecosystem cannot occupy the same niche. Explain. (1 mark)

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4. State two functions of aerenchyma tissue in hydrophytes. (2marks)

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5. The diagram below shows results of what happens to plant cell when placed in a certain solution.

X

 a) What was the nature of the solution in which the cell was placed? (1 mark)

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 b) Identify the force represented by the arrow X and explain how it develops. (2 marks)

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6. Which organelle would be numerous in the following cells; (2 marks)

 a) Liver cell

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 b) Palisade cell

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7. The scientific names of three animals leopard, wolf and lion in the family carnivora are; Panthera pardus, Canis lupas and Panthera leo respectively.

 a) Why are scientific names given in Latin? (1 mark)

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 b) What does *Canis* refer to? (1 mark)

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 c) Giving a reason, state the organisms that are MOST closely related. (1 mark)

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8. The word equation below shows a biological process.

 Water Hydrogen atom + oxygen

 a) Name the process. (1 mark)

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 b) Where does the process named in a) above take place? (1 mark)

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 c) State two conditions necessary for the process to occur. (2 marks)

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9. a) What is the importance of heartbeat in blood circulation? (1 mark)

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 b) If the nerve supply to the heart of a mammal is severed, the rhythmic heart movement will still go on and the heart continues to beat. Explain this observation. (1 mark)

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10. State the difference between habitat and ecological niche. (2 marks)

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11. The diagram below represents a stage during cell division.

 a) Name the stage of cell division. (1 mark)

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 b) Give two reasons for your answer in a) above. (2 marks)

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 c) State the significance of this stage of cell division in living organisms. (1 mark)

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12.) Name the causative agent for the following diseases;

 a) Typhoid (1 mark) ................................................................................................................................................................................................................................................................................................................................................

 b) Amoebic dysentery. (1 mark)

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13. Examine the diagram below and answer the questions that follow.



**X**

**A**

**B**

(a) Name the structures labeled: (3mks)

 **A**……………………………………………………………………………………………

**B**...…………………………………….……………………………………………………

**X**..…………………………………….……………………………………………………

14. a) Name the respiratory surface for gaseous exchange in insects. (1 mark)

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 b) State two adaptations of the site named in a) above. (2 marks)

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15. The graph below shows the effect of substrate concentration on the rate an enzyme catalyzed

 reaction.

**Substrate concentration**

**Rate of reaction**

**B**

**C**

A

 (a) Account for the shape of the graph between region B and C. (2mks)

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 (b) How can the rate of reaction be increased after point B?

(2mks)

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16. Explain the meaning of the following terms;

 a) Basal Metabolic Rate (1 mark)

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 b) Oxygen Debt (1 mark)

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17. In an experiment, the concentration of ions in the cell sap of reeds growing in a swampy area and the water in the swamp were determined. The data below was obtained. Study it and answer the questions that follow:

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| --- | --- | --- | --- | --- |
| Sample | Na+ | Mg2+ | Cl- | SO42- |
| Cell sap | 50 | 11 | 101 | 13 |
| Swamp water | 1.2 | 30 | 10.2 | 0.67 |

 a) Name the process by which uptake of the following ions by the reeds occurs. (2 marks)

 Na+ ions .....................................................

 Mg2+ ions ......................................................

 b) What effect would reduced oxygen supply have on the uptake of sulphate ions? (2 marks)

 Explain your answer.

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18. The diagram below shows a part of a nephron.



 a) State TWO differences in composition of blood in parts P and R. (2 marks)

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 b) State a characteristic feature of blood capillaries in part Q that is not found in other capillarities

 (1 mark)

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19.) State **two** functional differences between arteries and veins in mammals. (2mks)

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| Arteries | Veins |
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|  |  |

20. A set up was used to investigate a certain process in plants as shown in the diagram below.

Retort stand

Rubber tubing

Leafy shoot

Tap

Ruler

Capillary tube

Air bubble

Beaker

Water

 (a) What process was being investigated? (1 mark)

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 (1 mark)

 Reason ............................................................................................................................................................................................................................................................................................................Ptecaution.........................................................................................................................................................................................................................................................................................

 (c) How would changes in environment temperature affect the rate of movement of the air bubble? (1 mark)

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21. Julie observed eight onion epidermal cells across the field of view of a light microscope. If the field of view was 4mm in diameter, estimate the average size of the cells in micrometers

 (1mm= 1000$μ$m). (2 marks)

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22.) State **two** ways in which root hairs are adapted to their functions. (2mks) .............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

23. Explain how high humidity affects the rate of transpiration. (2mks)

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24. Give **three** differences between aerobic and anaerobic respiration. (3mks)

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| Aerobic respiration | Anaerobic respiration |
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25. State **one** use of each of the following excretory products in plants.

 (i) Tanin (1mk)

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 (iii) Quinine (1mk)

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26. State THREE adaptations of a leaf to gaseous exchange. (3 marks)

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27. State **three** types of asexual reproduction. (3mks)

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28.) Give **three** sources of water pollution.

(3mks)

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29. Name the antigens that determine human blood groups. (2mks)

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 30. a) The action of pepsin stops in the duodenum. Explain. (2 marks)

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 b) State two functions of the ileum in the alimentary canal of mammals. (2 marks)

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 **TRUST IN THE MOST HIGH GOD**