**Name: …………………………………………………...............…… Adm no ……..….......... Class.................**

**231/2**

**BIOLOGY FORM THREE**

**END OF TERM ONE**

**TIME: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES:**

* *Answer* ***ALL*** *the questions*
* *Answers should be written in the spaces provided*
1. Study the diagram of the organism shown below then answer the questions that follow.



1. State the phylum to which the organism belongs. (1mark)

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1. With reasons state the class to which the organism belongs. (1 mark)

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c) Name **two** diseases of the respiratory system. (2 marks)

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2. (a) Name the gaseous exchange structure in the following organisms.

 (i) Amoeba ..................................................................................................................(1 mark)

 (ii) Grasshopper............................................................................................................(1mark)

 (b) The diagram below illustrates the structure of a gill from a bony fish.

(i) Name the parts labelled A, B, C (3 marks)

 A ………………………………………………………………………………………………………..

 B …………………………………………..……………………………………………………………

 C ………………………………………………………………………………………………………..

(ii) State the function of the part labelled C (1 mark)

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(iii) How is part A adapted to carry its functions (2 marks)

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3.The table below shows the number of Leopards and Impala in a grassland park over a period of six years.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time in years | 1 | 2 | 3 | 4 | 5 | 6 |
| Number of Impala | 360 | 498 | 546 | 216 | 120 | 72 |
| Number of Leopard | 11 | 17 | 25 | 7 | 3 | 2 |

 (a) (i) What is the average number of Impala in the park during the six years. (2marks)

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1. Account for the decrease in the number of leopards between the 4th and 6th year? (2marks)

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(b) Identify the trophic level occupied by

(i) Leopards (1 mark)

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(ii) Tick feeding on the leopard. (1 mark)

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 (c) The two pyramids shown were obtained in the park.

 I II

Bird species

Caterpillar

Tree

Bird species

Caterpillar

Tree

(i) Identify each type of pyramid. (2 marks)

 I: ………………………………………………………………………………………………………..

 II:…………………………………………………………………………………………………………

1. The diagram below represents a simplified nitrogen cycle.

 

1. Name the group of bacteria represented by: (2 marks)

A. .................................................................................................................................................................

B. .................................................................................................................................................................

b) i) Name the group of organisms represented by C. ......................................................................(1 mark)

c) Give the reasons for your answer in b (i) above. (2 marks)

d) Define the term nitrification. (1 mark)

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e) Explain how excessive use of pesticides will affect nitrification. (2 marks)

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5.(a) State **three** structural differences between an artery and a vein of a mammal. (3 marks)

|  |  |
| --- | --- |
| Artery | Vein |
|  |  |
|  |  |
|  |  |

1. How are the capillary suited to their function? (3 marks)

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1. (i) What is blood transfusion? (1 mark)

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1. A person whose blood group is A died shortly after receiving blood from a person of blood group B. Explain the cause of death. (2 marks)

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***Answer question 6 (Compulsory) and EITHER question 7 or 8 in the spaces provided***

6. An experiment was carried out in which red blood cells were put in salt solutions of different concentrations. The table below shows the percentage of cells which were destroyed by haemolysis in different salt concentration.

|  |  |
| --- | --- |
| **Salt concentration****(g/dm³)**  | **% of RBC destroyed** **By haemolysis**  |
| **0** | **100** |
| **1** | **100** |
| **2** | **100** |
| **2.5** | **100** |
| **3.0** | **100** |
| **3.5** | **96** |
| **3.7** | **80** |
| **4.0** | **60** |
| **4.5** | **16** |
| **4.7** | **0** |
| **5.0** | **0** |
| **6.0** | **0** |

1. Draw a graph of percentage of red blood cells haemolysed against salt concentration (6 marks)

 (b) Explain haemolysis of red blood cells. (3marks)

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(c) From the graph, state:

(i) The salt concentration at which 50% red blood cells were haemolysed. (1 mark)

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1. The highest salt concentration when the largest number of red blood cells were haemolysed. (1 mark)

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1. (i) Suggest the normal salt concentration in the blood of the mammal from which the red blood cells were obtained. (2 marks)

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(ii) Give a reason for your answer in (d) (i) above. (1 mark)

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 (iii) What term is used to describe the solution with equal solute concentration as that of the cells? (1 mark)

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(e) Name the process in the human body that ensures that haemolysis of red blood cells is prevented. (1mrk)

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(f) State the role of osmosis in organisms. (4 marks)

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(7) Describe the adaptation of the skin to its functions (20mks)

(8) a) Describe how the digestion of a protein is achieved in the following portions of the alimentary canal.

1. Stomach (4 marks)
2. Duodenum (4marks)
3. (i) Describe the process of absorption at the root hair to the xylem of the root. (8mks)

(ii) Describe how temperature and light intensity affect the rate of transpiration. (4 mks)

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