**Name………………………………………………………ADM No……………………………………..….…….**

**School …………………………………………................. Class …………………..………………………**

**231/2**

**BIOLOGY**

**PAPER 2**

**(THEORY)**

**SEPTEMBER 2022**

**TIME: 2 HOURS**

***FORM FOUR***

**231/2**

**Biology**

**Paper 2**

**2 hours**

**INSTRUCTIONS TO CANDIDATES**

* Write your **name**, **index number** and **school** in the spaces provided
* Sign and write the date the examination was done in the spaces provided
* This paper consists of two sections, section A and section B. Answer **ALL** the questions in section A in the spaces provided on the question paper. In section B, answer question 6 **(compulsory)** and **either** question 7 **or** 8 in the spaces provided after question 8
* Be brief and precise. Unnecessary information and wrong spellings especially of technical terms shall be penalized
* All answers **must** be written in the **English** language

**FOR EXAMINER’S USE ONLY**

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| --- | --- | --- | --- |
| **QUESTION NUMBER** | **QUESTION**  | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| **SECTION A** | 1 | 08 |  |
| 2 | 08 |  |
| 3 | 08 |  |
| 4 | 08 |  |
| 5 | 08 |  |
| **SECTION B** | 6 | 20 |  |
| 7 | 20 |  |
| 8 | 20 |  |
| TOTALSCORE |  | **80** |  |

1. The diagram below shows the exchange site between circulatory system and body cells.



a) State **two** adaptations of the capillaries. (2mks)

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b) (i) Name the blood cells labeled B. (1mk)

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 (ii) State the gas that diffuses from B to the tissue cells. (1mk)

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c) State **two** functions of the part labeled A. (2mks)

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d) Name the blood vessel with the highest concentration of;

 Oxygen. (1mk)

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Urea. (1mk)

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1. The diagram below shows how blood glucose in mammalian body is regulated.

 Pancrease secretes

 Rise Hormone X

 Fall

 Normal glucose level Normal glucose level

 90mg/100ml 90mg/100ml

 Fall rise

 Less hormone X secreted

 Hormone Y released

(a) Name the hormone X and Y (2mks)

 X \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Y \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(b) State two ways by which hormone X lowers glucose level in the blood when it rises above 90mg/100ml (2mks)

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 (c) Name the organ that produces hormone Y (1mk)

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 (d) Suppose there is deficiency of hormone X, state the disease the person would suffer

 from (1mk)

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 (e) Explain how the disease mentioned in (d) above can be controlled. (2mks)

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1. In human beings, a downward pointed frontal hairline (“windows peak”) is a heritable trait. A person with windows peak always has at least one parent who has his trait; whereas persons with frontal hairline may occur in families in which one or even both parents have windows peak. Using B and b to symbolize genes for this trait.

a) Determination the f1 generation if a homozygous windows peak male parent is married to a Homozygous frontal hairline female parent. (4mks)

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b) State two causes of variations. (2mks)

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c) Name two examples of discontinuous variation. (2mks)

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1. The drawing below represents a mature bread mould (rhizopus).Study it and answer the questions which follow.



a) Name the structures labeled A, B and C. (3mks)

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

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

C.......................................................................................................................................................

b) Identify the type of asexual reproduction represented in the diagram (1mk)

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c) Give one function of structure C. (1mk)

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d) Define the term fertilization. (1mk)

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e) Compare an ovum cell and a zygote. (2mks)

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1. The diagram below shows three different types of neurons along a reflex.



a) Identify the neuron labeled 1, 2 and 3 (3mks)

 1..............................................................................................................................................

 2..............................................................................................................................................

 3............................................................................................................................................

b) Using arrow show the direction of impulse transmission on the diagram. (1mks)

c) Name the part of the spinal cord where the cell bodies of neuron 2 and 3 are located.

 (1mk)

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**SECTION B**

 **Answer question 6(compulsory) in the spaces provided and either question 7 or 8 in the spaces provided after 8.**

1. During germination and growth of a cereal, the dry weight of endosperm, the embryo and the total dry weight were determined at two day intervals. The results are shown in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| Time after planting (days) | Dry weight of endosperm (mg) | Dry weight of embryo (mg) | Total dry weight (mg) |
| 0 | 43 | 2 | 45 |
| 2 | 40 | 2 | 42 |
| 4 | 33 | 7 | 40 |
| 6 | 20 | 17 | 37 |
| 8 | 10 | 25 | 35 |
| 10 | 6 | 33 | 39 |

1. Using the same axes, draw graphs of dry weight of endosperm, embryo and the total dry weight against time. (7marks)





1. What was the total dry weight on day 5 (1mark)

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1. Account for
2. Decrease in dry weight of endosperm from 0 to 10 (2marks)

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1. Increase in dry weight of embryo from day 0 to day 10 (2marks)

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1. Decrease in total dry weight from day 0 to day 8 (1mark)

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1. Increase in total dry weight after day 8 (1mark)

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1. State two factors within the seed and two outside the seed that cause dormancy
2. Within the seed. (2marks)

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1. Outside the seed (2marks)

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1. Give two characteristics of meristematic cells (2marks)

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1. Explain how abiotic factors affect plants. (20marks)
2. (a) Discuss eye accommodation. (10mks)

(b) Discuss the process of hearing in man. (10mks)

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