**MID TERM SERIES –TERM 1-2023**

**BIOLOGY (232/1)**

**FORM 4**

**TIME: 2 HOURS**

**PAPER 1**

**INSTRUCTIONS**

1. **All Questions are Compulsory**
2. **Write your Answers in the Spaces Provided**
3. **Wrong Spelling of Technical Terms shall be Penalized**

|  |  |
| --- | --- |
| Max Score | Student’s Score |
|  |  |
| 80 |  |

1. The photomicrograph shown below is a section of a cell



1. Using the letters provided, label the organelle that: (2mks

i) Is found in high number in kidney cells (**KC**)

ii) Is abundant in secretory glands (**SG**)

1. State the importance of cytoplasmic streaming to a cell (1mk

…………………………………………………………………………………………………………………………………………………………………………………....

1. An athlete experienced a muscle cramp after a sprint race
2. Name the acid that accumulated in her muscles to bring about the discomfort (1mk

………………………………………………………………………………………....

1. Describe the fate of this acid when the athlete takes a rest (2mks

…………………………………………………………………………………………………………………………………………………………………………………....

1. State the functions of the following cells (3mks

i) Sertoli cells

………………………………………………………………………………………....

ii) Interstitial cells

………………………………………………………………………………………....

iii) Guard cells

………………………………………………………………………………………....

1. The experimental set up shown below was placed in the sunshine for 2 hours to study a particular phenomenon in plants



1. What is the expected result after the 2hours of experiment? (1mk

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1. Account for the answer given in a) above (2mks

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………....

1. What is the expected result if the experiment was done under high humidity? (1mk

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1. Name (2mks
2. A cell in the human body that lacks mitochondria

…………………………………………………………………………………………

1. A Kingdom whose members lack mitochondria

…………………………………………………………………………………………

1. Fill the table below to show differences between guttation and transpiration (2mks

|  |  |
| --- | --- |
| **Guttation** | **Transpiration** |
|  |  |
|  |  |

1. A plant cell was placed in solution **X** and after a while it appeared as cell **B** shown below



**P**

1. Which **TWO** features show that cell **B** is plasmolysed? (2mks

…………………………………………………………………………………………………………………………………………………………………………………....

1. Which process facilitated the presence of solution **X** in part **P**? (1mk

…………………………………………………………………………………………

1. What is the nature of solution **X**? (1mk

…………………………………………………………………………………………

1. Name the tissue that forms the following hormones (2mks
2. Glucagon ………………………………………………………………………………
3. Progesterone ……………………………………………………………………………
4. Learners suspected that a liquid they found in the laboratory contained starch
5. Describe a procedure they will use to determine whether starch was present (2mks

…………………………………………………………………………………………………………………………………………………………………………………....………………………………………………………………………………………....

1. State the expected colour change for them to conclude that starch was present (1mk

…………………………………………………………………………………………

1. What is the advantage of plants storing carbohydrates as starch? (1mk

…………………………………………………………………………………………………………………………………………………………………………………....

1. The diagram below shows the root of a leguminous plant



1. Name the bacterium found in the root nodules (1mk

…………………………………………………………………………………………

1. How are the bacteria named in a) important to the legume? (1mk

…………………………………………………………………………………………

1. The following data was collected from study of same crop grown in different temperature



1. Which is the ideal temperature for the growth of this crop? (1mk

…………………………………………………………………………………………

1. Account for the yield obtained in plot **D** (2mks

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Explain the ways by which movement of the ovum is achieved along the oviduct.

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………..…………………………………………………(2mks

1. a) Name the salivary gland found beneath the tongue (1mk

………………………………………………………………………………………………………………………………………………………………………………………………

b) Outline **TWO** ways in which saliva is suited to its function (2mks

……………………………………………………………………………………………………………………………………………………………………………………

1. The picture below shows a disorder that affects blood vessels in humans



1. Name the disorder shown above (1mk

…………………………………………………………………………………………

1. Which blood vessel is affected by this disorder? (1mk

……………………………………………………………………………………………………………………………………………………………………………………

1. A tall garden pea plant was crossed with a dwarf garden pea plant.

a) Given that the allele ‘**d**’ for dwarfness is recessive, write the genotype of the offspring if the tall garden pea used was: (2mks

1. Pure breed ………………………………………………………………………………
2. Heterozygous …………………………………………………………………………...

b) Write the base sequence of the DNA from which the messenger-RNA shown below was derived. **ACUGAACCGUAU** (1mk

………………………………………………………………………………………………

1. Use the illustration shown below to answer the questions that follow



**Z**

1. Why is the right kidney slightly pushed higher up compared to the left kidney? (1mk

…………………………………………………………………………………………

1. Explain how gland labelled **Z** help raise amount of Sodium ions (Na+) in the blood

……………………………………………………………………………………………………………………………………………………………………………..(2mks

1. The illustration shown below is of a common organism



1. Why is the above organism medically important globally? (2mks

……………………………………………………………………………………………………………………………………………………………………………………

1. Name the class to which the organism belongs. (1mk

…………………………………………………………………………………………

1. Give **TWO** reasons for your answer in b) above (2mks

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1. How are the following significant to the development of seeds
2. Seed dormancy (2mks

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1. Seed dispersal (2mks

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1. Use the images shown below to answer questions that follow



1. Why are the structures above said to be homologous structures? (1mk

……………………………………………………………………………………………………………………………………………………………………………………

1. Which type of evolution is represented above? (1mk

…………………………………………………………………………………………

1. What is the significance of the type of evolution named in b) to animals? (1mk

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1. A protein has 100 amino acids. Calculate the number of nitrogenous bases in the gene for this protein (2mks

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Study the photomicrograph shown below and answer the questions that follow



100ߎm

1. Name the parasite shown in the photo above (1mk

…………………………………………………………………………………………

1. Which organism is the vector of the parasite? (1mk

…………………………………………………………………………………………

1. Calculate the magnification used to obtain the image shown above (3mks

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. a) Name the chemical form in which the following are transported in the blood (2mks
2. Carbohydrates

……………….…………………………………………………………………………

1. Carbon (IV) Oxide

................................…………………………………………………………………….

b) Explain why transfusion of blood from a blood group **B** donor to a recipient with blood group **A** may be fatal. (2mks

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Use the photograph shown below to answer questions that follow



1. Explain the role of prothoracic gland during this phase of metamorphosis (2mks

……………………………………………………………………………………………………………………………………………………………………………………

1. State the significance of this process to the life of the insect (1mk

…………………………………………………………………………………………

1. An animal has 6 molars, 2 canines, 4 incisors and 6 premolars in the lower jaw while the upper jaw has 6 molars, 4 premolars, 0 incisors and 2 canines in the upper jaw
2. What is the significance of absence of incisors in the upper jaw to the feeding of the animal (2mks

……………………………………………………………………………………………………………………………………………………………………………………

1. Write the correct dental formula for the animal (1mk

…………………………………………………………………………………………

1. Why do such animals have a longer alimentary canal? (2mks

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1. Describe double fertilization in flowering plants (4mks

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