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

**231/**

**BIOLOGY FORM THREE**

**TERM TWO: MID-TERM**

**JUNE/ 2024**

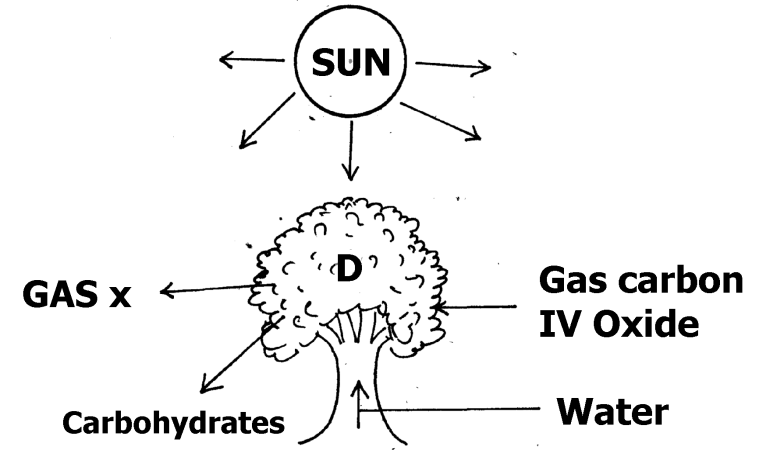
**TIME: 2HRS 30 MIN**

**JOINT EXAMINATION 2024**

**INSTRUCTIONS TO CANDIDATES:**

* *Answer* ***ALL*** *the questions*
* *Answers should be written in the spaces provided*

1. The diagram below illustrate the first stage in the energy flow in the ecosystem



a) Identify (i) organelles responsible for activity in D.

i) in D………………………………………….................................................. (1mk)

(ii) Gas X ...............................................................................................................(1mk)

b) Suggest the roles played by each of the following in the process illustrated above.

i) Light energy (1mk)

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ii) Water (1mk)

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iii) Carbon (IV) Oxide (1mk)

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c) Give **three** ways in which the carbohydrates produced in the organelles at D is utilized in the plants. (3mks)

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2. State the functions of the following points of a light microscope.

(a) Diaphragm (1mk)

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(b) Condenser (1mk)

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3. State the functions of the following organelles.

(a) Nucleolus......................................................................................................................(1mk)

(b) Ribosomes....................................................................................................................(1mk)

4. The reaction represented by the equation below occurs in the body.

Hydrogen peroxide Enzyme Y Oxygen + Water

(a) Name enzyme Y..........................................................................................................(1mk)

(b) Name an organ in the body where the reaction occurs. (1mk)

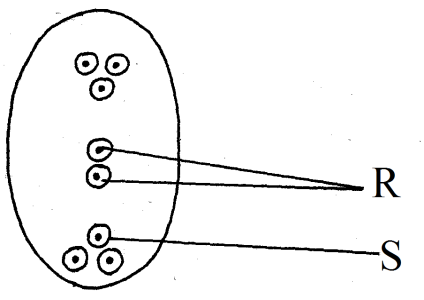
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(c) What is the significance of the reaction (1mk)

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5. Study the diagram of the embryo sac below and answer questions that follow.



a) Name the type of fertilization that occurs in the embryo sac. (1mk)

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b) What do the structure labelled R and S develop into after fertilization. (2mks)

R........................................................................................................................................................

S........................................................................................................................................................

6. a) Explain how the following factors control population.

i) Predation (1mk)

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ii) Competition (1mk)

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iii) Parasitism (1mk)

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b) A cat was used to control the population of rats.

i) What term is used to refer to this method. (1mk)

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ii) State **one** advantage of using the method you named in (i) above. (1mk)

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7. State the role played by the following substance in digestion.

(i) Hydrochloric acid (2mks)

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(ii) Bile salts (2mks)

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8. The chemical equation below represent a reaction that occurs in cels.

2C51H98O6 + 145O2 102CO2 + 98H2O

(i) Calculate the respiratory quotient (RQ) (2mks)

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(ii) Identify the substrate used in the reaction. (1mk)

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1. Give two reasons why the substrate you have identified in 9. (ii) above is not the

not the main respiratory substrate. (2mks)

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9. List down **five** differences between mitosis and meiosis (5mks)

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10. Explain what happens in humans when the concentration of glucose in the blood

decreases below normal level. (4mks)

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11. State **two** adaptations of the alveolus to its functions. (2mks)

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12. (a) Explain the role of oxygen in Active transport (1mk)

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(b) Name **two** processes that depend on Active transport in animals (2mks)

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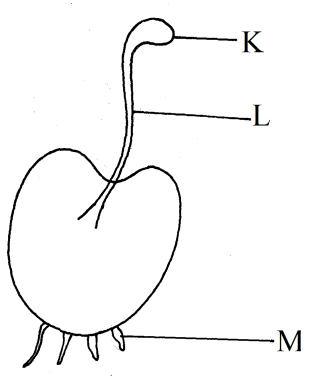
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13. Name support tissues in plants thickened with:

(a) Cellulose.....................................................................................................................(1mk)

(b) Lignin ..........................................................................................................................(1mk)

17. Study the diagram below and answer questions that follow

a) State the division the organism belongs (1mk)

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b) Name the parts labelled K and L (1mk)

K......................................................................................................

L.......................................................................................................

c) What is the function of the part labelled M. (1mk)

M.......................................................................................................................................................

18. a) Draw a well labeled transverse section of a berry fruit (6mks)

b) State **four** factors that hinder self-pollination and fertilization. (4mks)

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19. A mango tree is known as mangifera Indica

(a) Identify two mistakes made in the writing of the name (2mks)

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(b) What is the scientific naming called? (1mk)

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20. Differentiate between gamosepolous and polysepolous (4mks)

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21. State **two** ways in which chloroplasts are adapted for photosynthesis (2mks)

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22. State the role of the following chemicals in a test for non-reducing sugar.

(i) Hydrochloric acid (1mk)

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(ii) Sodium hydrogen carbonate (1mk)

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23. Name **two** chemical compounds that are protein in nature that regulate metabolic activities in the body (2mks)

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24. State **three** environmental factors that increase the rate of transpiration. (3mks)

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25. Carbon (II) oxide is a respiratory poison. Explain (3mks)

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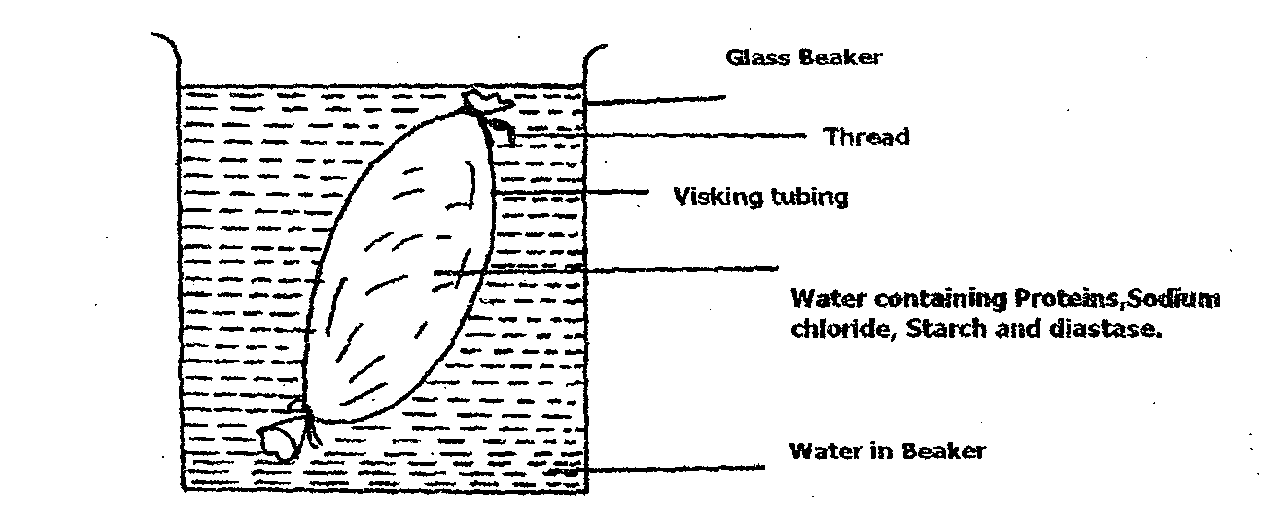
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26. In a physiological experiment, starch, protein, diastase and sodium chloride were added to water and put inside a visking tubing. The visking tubing was then placed in a water bath maintained at a temperature between *35* - 40°C. The set up was as shown in the diagram below.



The following observations were made after the procedures indicated.

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| --- | --- | --- |
| **Contents in** | **At the start of experiment** | **After 1 hour** |
| Visking tubing | i) Solution tastes salty | Solution tastes salty |
| ii) Visking tubing is not firm | Visking tubing is firm |
| iii) After boiling with Benedicts  solution, solution remains blue | After boiling with Benedicts solution the solution turns brown |
| iv) On addition of solution  hydroxide followed by copper  sulphate solution to the solution,  the colour changes to purple | On addition of sodium hydroxide followed by coppers sulphate to the solution, the colour changes to purple |
| Beaker | i) Water is tasteless | Solution tastes sweet/salty |
| ii) After boiling solution with  Benedicts solution, Blue colour  remains | After boiling solution with Benedicts solution, colour turns to brown |
| iii) On addition to sodium hydroxide  followed by copper sulphate solution,  colour remains blue | On addition of sodium hydroxide followed by copper sulphate solution, colour remains blue |

a) Name the process by which salt moved into the water in the beaker from the visking tubing.

(l mk)

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b) i) Name the food substance responsible for the brown colour observed after 1 hour both in

the beaker and visking tubing when solutions are boiled with benedicts solution. (1 mk)

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ii) Account for the observation in (b i) above. (3mks)

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c) i) Name the food substance tested with sodium hydroxide followed by copper sulphate solution(s) (1mk)

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ii) Account for the absence of the food substance named in (c i) above in the beaker after

1 hour. (l mk)

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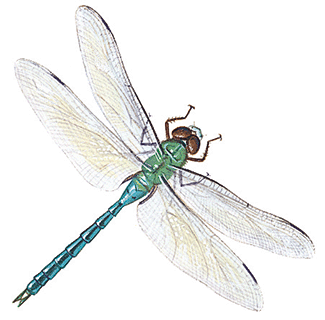
d) After one hour the visking tubing was firm. State the term used to describe this state.(1 mk)

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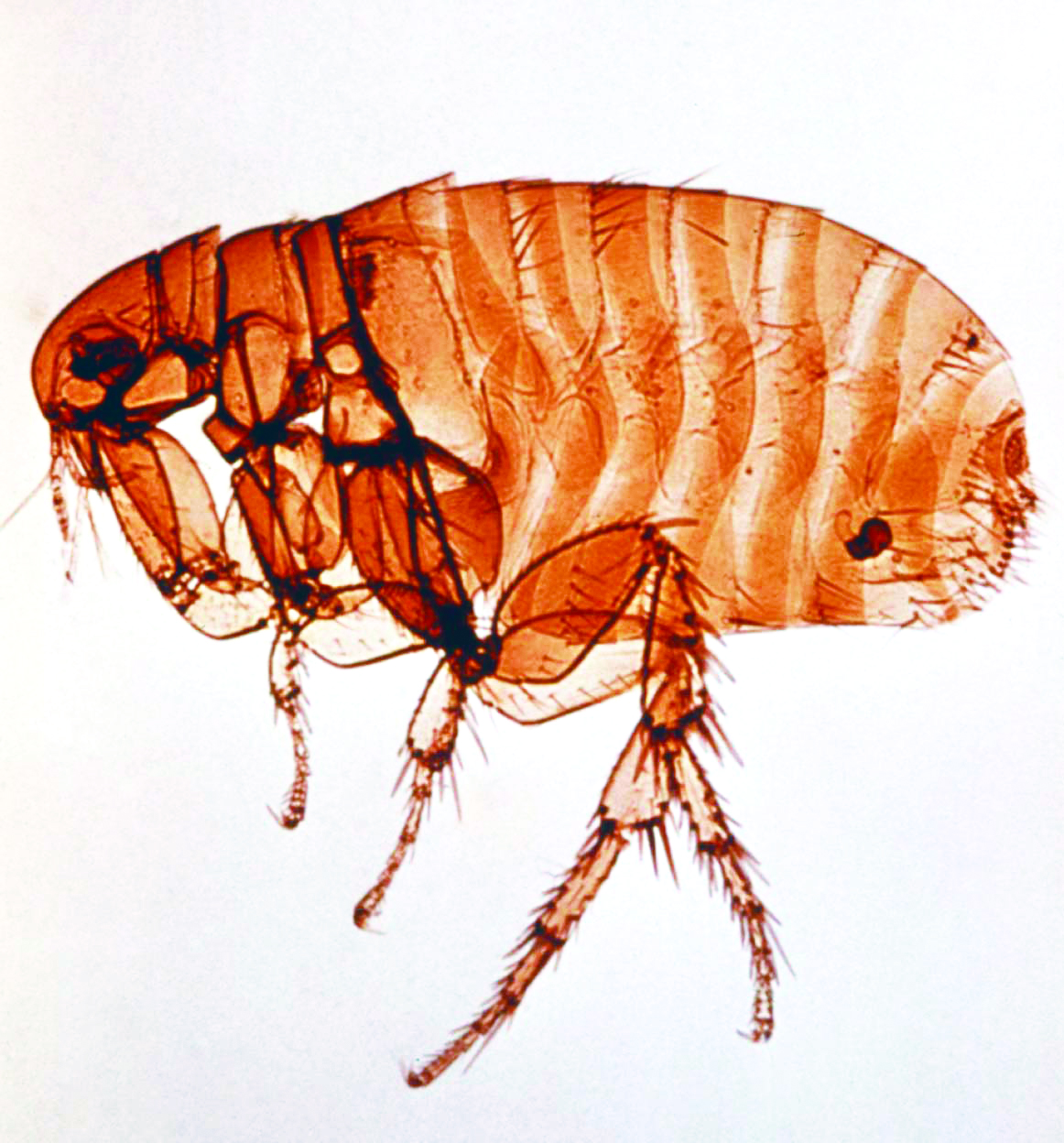
27. You are provided with photographs of specimens labelled **P**, **Q**, **R**, **S** and **T**. Examine them carefully.

**Q**

**P**

**R**

**S**

**T**

(a) Use the dichotomous key provided below to answer the questions that follow

1 a Wings present……………………………………………….Go to 2

b Wings absent………………………………………………..Go to 7

2 a One pair of wings…………………………………………...Housefly

b Two pairs of wings …………………………………….......Go to 3

3 a Wings membranous ………………………………………..Go to 4

b Hind wings only membranous……………………………....Go to 6

4 a Long and thin abdomen…………………………………......Dragon fly

b Medium sized abdomen…………………………………......Go to 5

5 a Wings peckled….....................................................................Butterfly

b Wings not peckled …………………………………………..Bee

6 a Forewings shell-like……………………………………........Beetle

b Fore wings hand……………………….………………........Grasshopper

7 a Body laterally flattened…..……………………………........Louse

b Body horizontally flattened…………………..………..........Flea

1. Use the dichotomous key provided to identify each of the specimens. (5mks)

Specimen Steps followed Identity

**P**…………………….. ……………………

**Q**…………………….. ……………………

**R** …………………….. ……………………

**S** …………………….. …………………….

**T** …………………….. …………………….

1. (i) State the class to which the specimens belong. (1mk)

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

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1. Give **two** observable similarities and **three** observable differences between specimens **S** and **T**.
2. Observable similarities. (2mks)

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1. Observable differences. (3mks)

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(d)(i) Identify the type of habitat specimen **S** is likely to be found living. (1mk)

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

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