

MINISTRY OF EDUCATION
DEPARTMET OF BASIC EDUCATION(SECONDARY)
END OF TERM EXAMINATION

NAME: _____ ADM NO. _____ CLASS: _____

231/2

BIOLOGY (THEORY)

PAPER 2

END OF TERM 3 - 2024

TIME: 2 HOURS

FORM 3

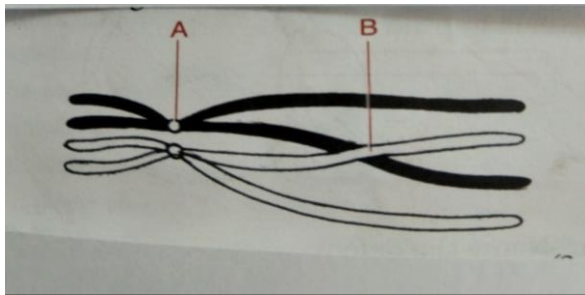
INSTRUCTIONS TO CANDIDATES:

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- **This paper consists of two sections, A and B.**
- **Answer all the questions in sections A in the spaces provided.**
- **In section B, answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.**
- **Candidates should answer the questions in English.**

SECTIONS A: (40 marks)

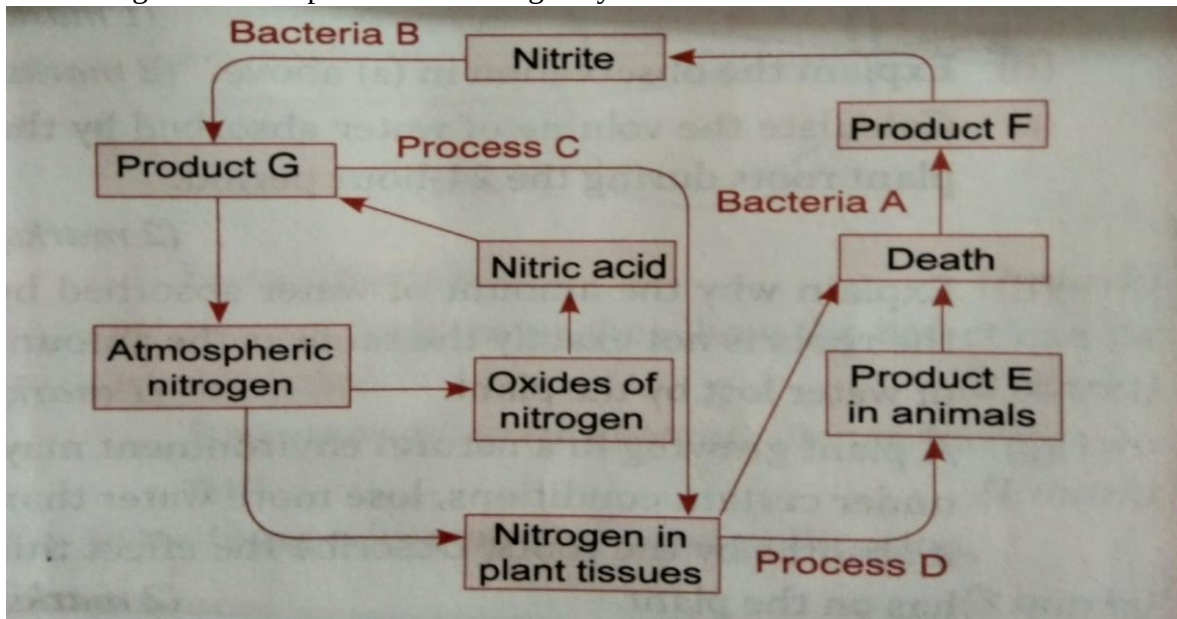
Answer All the Questions in this section in the spaces provided.

1. The diagram below shows a phenomenon which occurs during cell division.



- a) Name the parts labelled A and B. (2 mks)
A _____
B _____
- b) State the biological importance of the parts labelled A and B. (2 mks)
- c) Identify the type of cell division in which this phenomenon occurs. (1 mk)
- d) Name the organs in human beings in which the phenomenon occurs. (2 mks)
- e) How many daughter cells are formed during this cell division? (1 mk)

2. The figure below represents the nitrogen cycle.



a) Identify bacteria A and B. (2 mks)

A _____
B _____

b) Name processes C and D. (2 mks)

C _____
D _____

c) Name products E and F. (2 mks)

E _____
F _____

d) State **two** ways in which free Nitrogen in the air is made available for plant use.

3. An organism was exposed to different temperatures but the body temperature remained constant at 36.7°C.

a) What type of organism is it in terms of thermoregulation? (1 mk)

b) Describe **one** advantage of this condition to the organism. (1 mk)

c) List **two** ways by which the body of a human being loses heat.

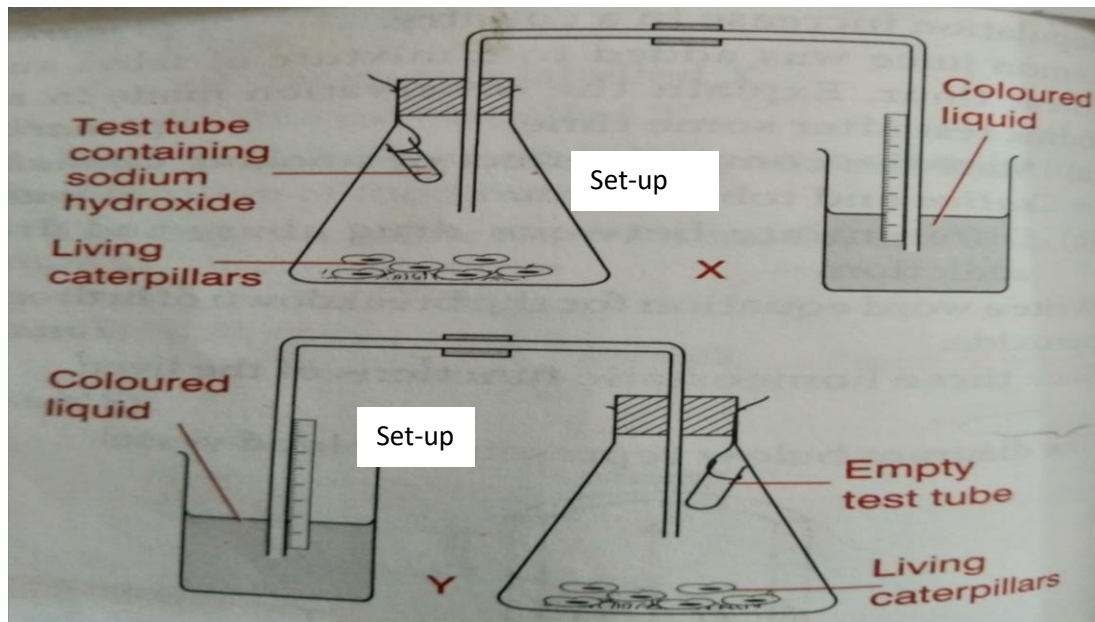
(2 mks)

d) What changes occur in the skin at a room with temperature of 40°C .

(3 mks)

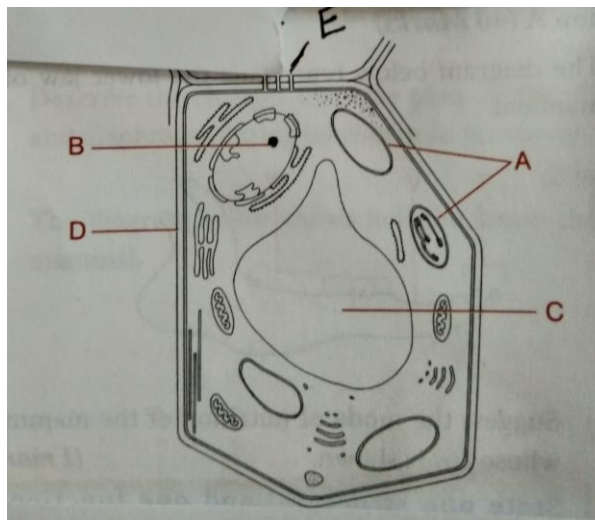
e) Explain why it is important to reduce heat production in the body from 40°C to 36.7°C ? (1 mk)

4. The diagrams below show two experimental set-ups X and Y, that were placed in the sunlight.



- a) After half an hour, the coloured liquid in set-up X had risen to the top of the scale. Explain this observation. (3 mks)
- b) Suggest the purpose of the set-up Y in the experiment. (1 mk)
- c) What would be the observation in X if the caterpillars were replaced with fresh green vegetables? (2 mks)
- d) What modifications are required for the green leaves to register the same results as the caterpillars. (2 mks)

5. The diagram below represents a cell seen under an electron microscope. Study it and answer the questions that follow.



- a) i) Suggest the kingdom from which the cell shown in the diagram was obtained. (1 mk)

ii) Give **two** reasons for your answer in a(i) above.

(2 mks)

b) Name the parts labelled A and B.

(2 mks)

A _____

B _____

c) State the functions of the part labelled C.

(1 mk)

d) Name a structure component of the part labelled D.

(1 mk)

e) Name part labelled E.

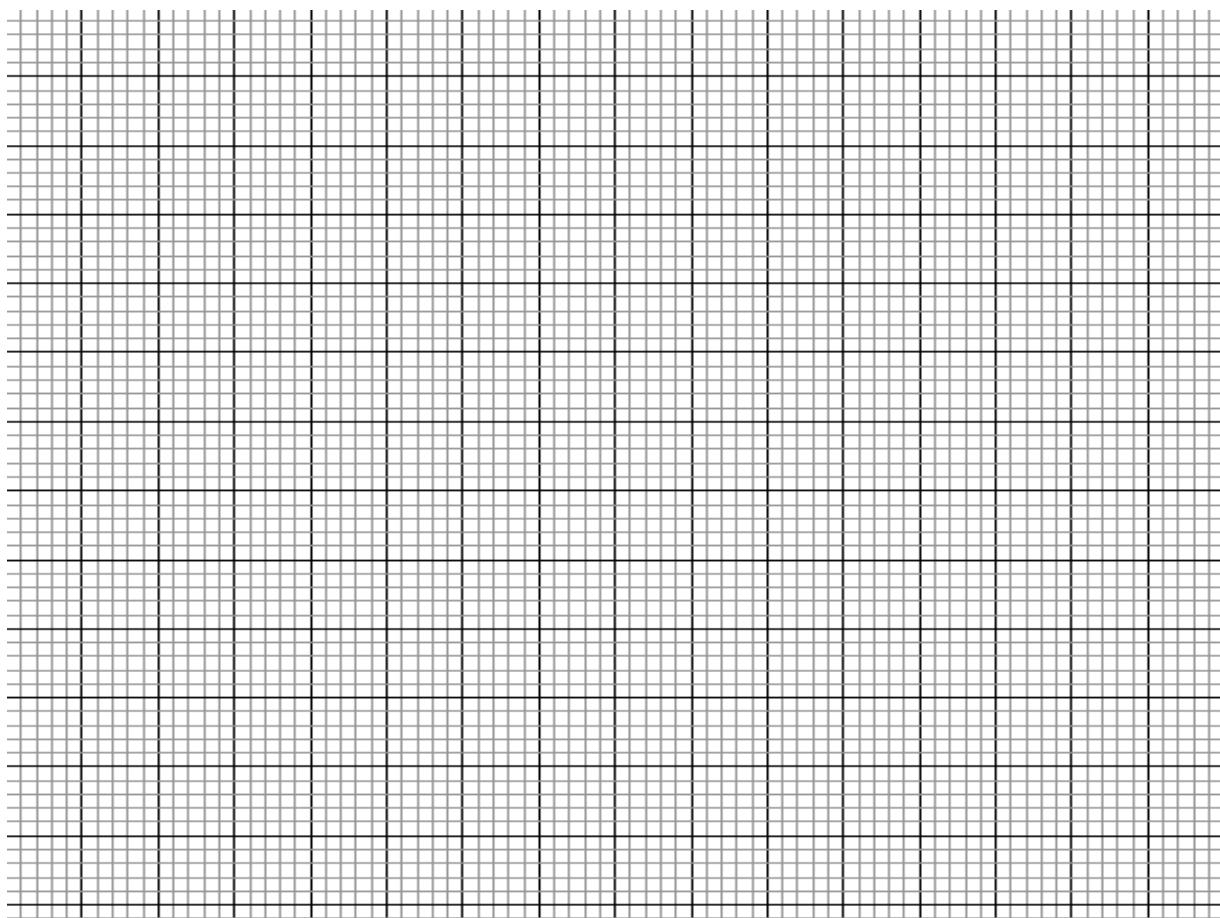
(1 mk)

SECTIONS B: (40 marks)**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 concentrations.

Salt concentration (g/dm ³)	% R.B.C 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

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



- b) Explain haemolysis of red blood cells. (4 mks)
- c) From the graph, state:
- i) The salt concentration at which 50% red blood cells were haemolysed. (1 mk)
 - ii) The highest salt concentration when the largest number of red blood cells were haemolysed. (1 mk)
- d) i) Suggest the normal salt concentration in the blood of the mammal from which the red blood cells were obtained. (1 mk)
- ii) Give a reason for your answer in d(i) above. (1 mk)
- iii) What term is used to describe the solution with equal solute concentration as that of the cells? (1 mk)
- e) Name the process in human body that ensures that haemolysis of red blood cells is prevented. (1 mk)

f) State the role of osmosis in organisms.

(5 mks)

7. Describe what happens to a meal of oily beans and maize from the time of ingestion up to the time of absorption. (20 mks)

8. a) What is transpiration? (2 mks)

b) Explain how the various environmental factors affect the rate of transpiration. (18 mks)