Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

JUNE 2025



LIFE SCIENCES

MARKS: **150**

TIME: **2½ hours**

This question paper consists of 18 pages.

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. **Start the answers to EACH question at the top of a NEW page.**
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly

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SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A- D) next to the question number (1.1.1 to 1.1.10) in your ANSWER SHEET, for example 1.1.11 D.

1.1.1 The products of photosynthesis are …

A carbon dioxide and water.
B water and glucose.
C glucose and oxygen.
D oxygen and carbon dioxide.

1.1.2 Mutualistic nitrogen fixing bacteria …

A occur in the colon of humans.
B occur in the nodules of legumes (peas and beans)
C bring about immunity to disease
D convert nitrates into nitrogen

1.1.3 What are some positive contributions of invertebrates to farming and the environment?

A They damage crops, food and clothes, and may poison us if they bite us.
B They do not have a backbone.
C They pollinate flowers, make burrows in the soil, turn over soil and fertilize it and help decompose dead plant or animal matter.
D They prey on species that facilitate growth of agricultural crops.

1.1.4 The reproductive organ in the angiosperms is the …

A root.
B stem.
C leaf.
D flower

1.1.5 Photosynthesis in green leaves takes place ...

A continuously.
B only during the day.
C only during the night.
D only in tissue containing chloroplasts.

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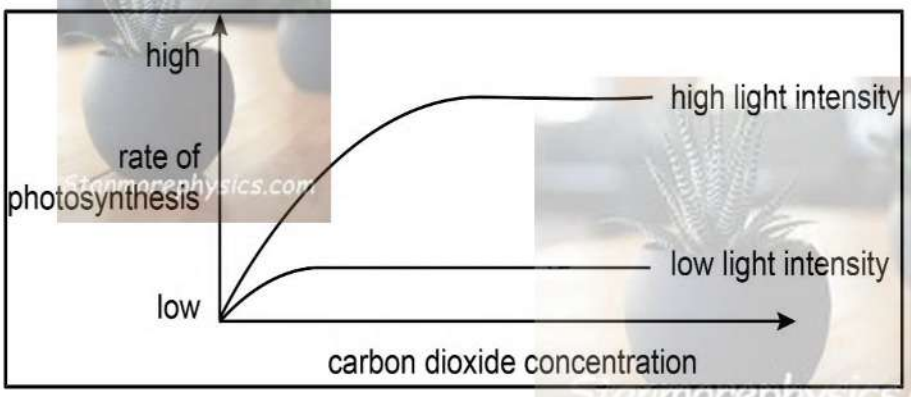
1.1.6 The list below refers to the biological importance of fungi.

(i) Act as decomposers to return nutrients to the soil
(ii) Used in breweries to produce alcohol
(iii) Used in bakeries to make bread
(iv) Mushroom acts as a food source

Which ONE of the following combinations represents economic importance of the fungi for the country?

A (i), (ii), (iii) and (iv)
B (i), (iii) and (iv) only
C (ii), (iii) and (iv) only
D (i), (ii) and (iii) only

1.1.7



The graph shows the interaction of two factors that affect the rate of photosynthesis.

Read the following statements:

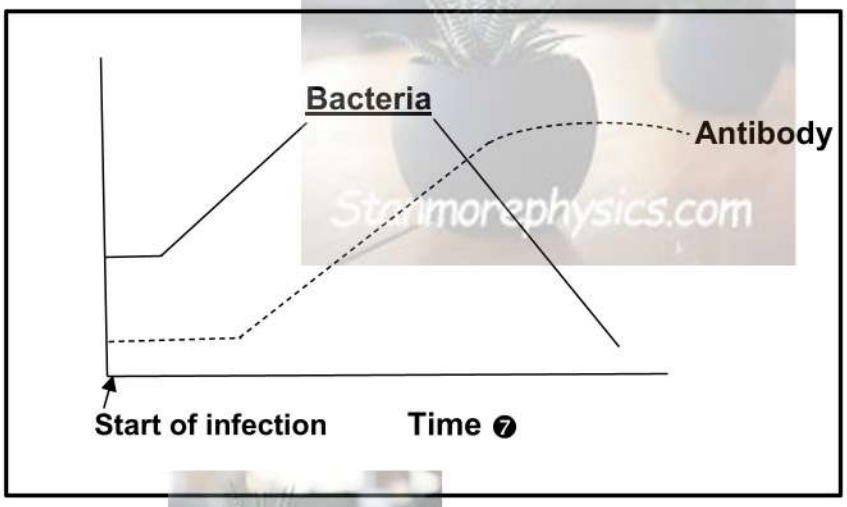
- **Statement 1:** At low light intensity an increase in carbon dioxide concentration will cause an initial increase in the rate of photosynthesis.
- **Statement 2:** An increase in carbon dioxide concentration will result in a higher rate of photosynthesis at a higher light intensity
- **Statement 3:** At high carbon dioxide concentration an increase in light intensity does not change the rate of photosynthesis.

Which combination of the statements correctly describe(s) the relationships shown in the graph?

A 1, 2 and 3
B Only 2 and 3
C Only 1
D Only 1 and 2

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QUESTION 1.1.8 REFERS TO THE GRAPH BELOW SHOWING THE IMMUNE RESPONSE AFTER AN INFECTION BY A BACTERIA.



1.1.8 Which ONE of the following is the conclusion that can be made from the graph above?

A A decrease in bacteria leads to an increase in antibodies
B When antibodies increase bacteria remains the same
C An increase in bacteria leads to an increase in antibodies, which then leads to the decrease in bacteria
D An increase in antibodies leads to an increase in bacteria

1.1.9 Streptococcus bacteria are not motile (they cannot move).

The image below shows a colony of Streptococcus bacterium.



Which ONE of the following is the reason why the Streptococcus bacterium is not capable of movement on its own?

A It does not have flagella
B It does not have nucleic acids
C It does not have ribosomes
D It does not have cell wall

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1.1.10 Learners did an investigation to determine the number of people suffering from tuberculosis in the community.
Below is the procedure (not in order) used for the investigation.

They:

1. Went to the clinic to get information on the number of people treated for tuberculosis per month
2. Made a conclusion based on their results
3. Drew up a table to record their results
4. Analysed the results and represented the information in graphs 5. Planned how they were going to carry out the investigation

Which ONE of the following is the correct sequence of the steps of the procedure done during the investigation?

A 1❼2❼3❼4❼5
B 5❼1❼3❼4❼2
C 4❼5❼2❼3❼1
D 5❼3❼1❼2❼4

(10 x 2)
(20)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.8) in your ANSWER SHEET.

1.2.1 The collective name for disease-causing micro-organisms

1.2.2 The type of reproduction in bacteria where the organism splits into two

1.2.3 A plant body with no true roots, stem or leaves

1.2.4 The presence of a definite head that contains sense organs in animals

1.2.5 The kingdom to which bacteria belong

1.2.6 The removal of undigested waste from the body

1.2.7 The organelle in which the process of cellular respiration takes place

1.2.8 The flap-like structure which prevents food from entering the trachea in the pharynx (8 x 1) **(8)**

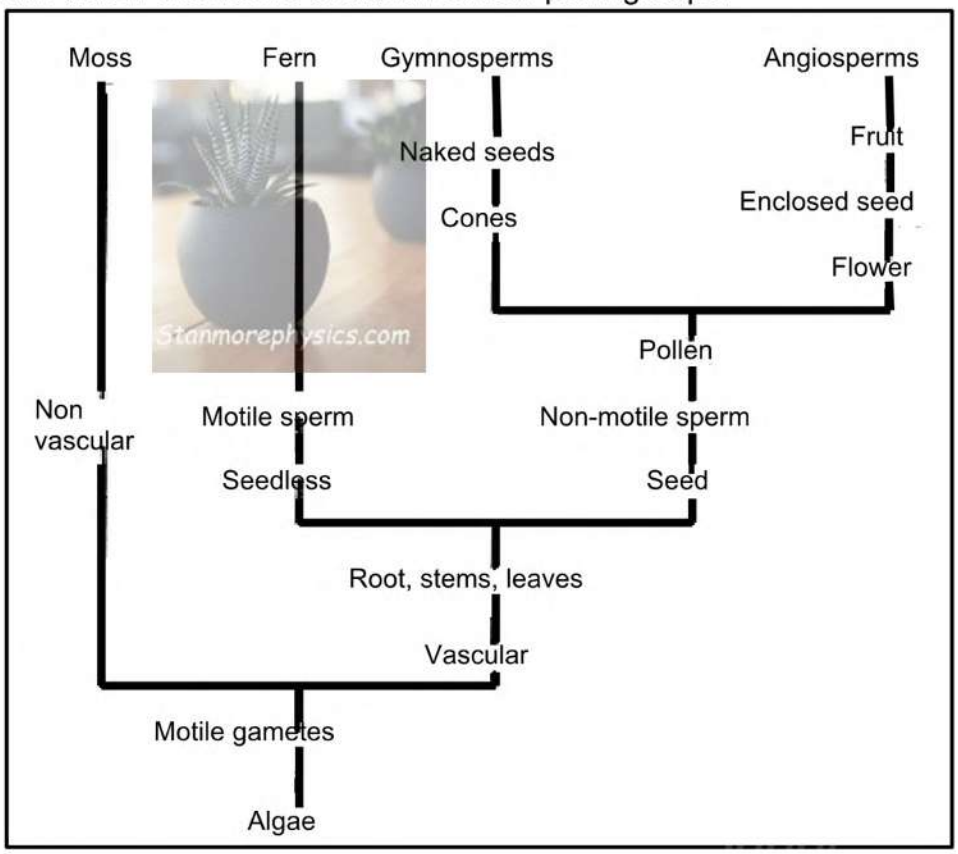
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1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B or NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B,** or **none,** next to the question number (1.3.1 to 1.3.3) in the ANSWER SHEET.

	COLUMN I	COLUMN II	
1.3.1	An organism containing cells that have a membrane-bound nucleus	A: B:	Prokaryote Eukaryote
1.3.2	The conditions needed for the optimum growth of fungi	A: B:	Moist Dark
1.3.3	The body has jointed appendages and an exoskeleton.	A: B:	Arthropoda Chordata

(3 x 2) **(6)**

1.4 The diagram below shows the evolution of four plant groups.



1.4.1 Name the type of diagram shown above. (1)

1.4.2 Identify the common ancestor for all four plant groups. (1)

1.4.3 Which TWO plant groups:

(a) Produce pollen (2)

(b) Have sperm that are non-motile (2)

1.4.4 Which group of plants cannot survive outside water? (1)

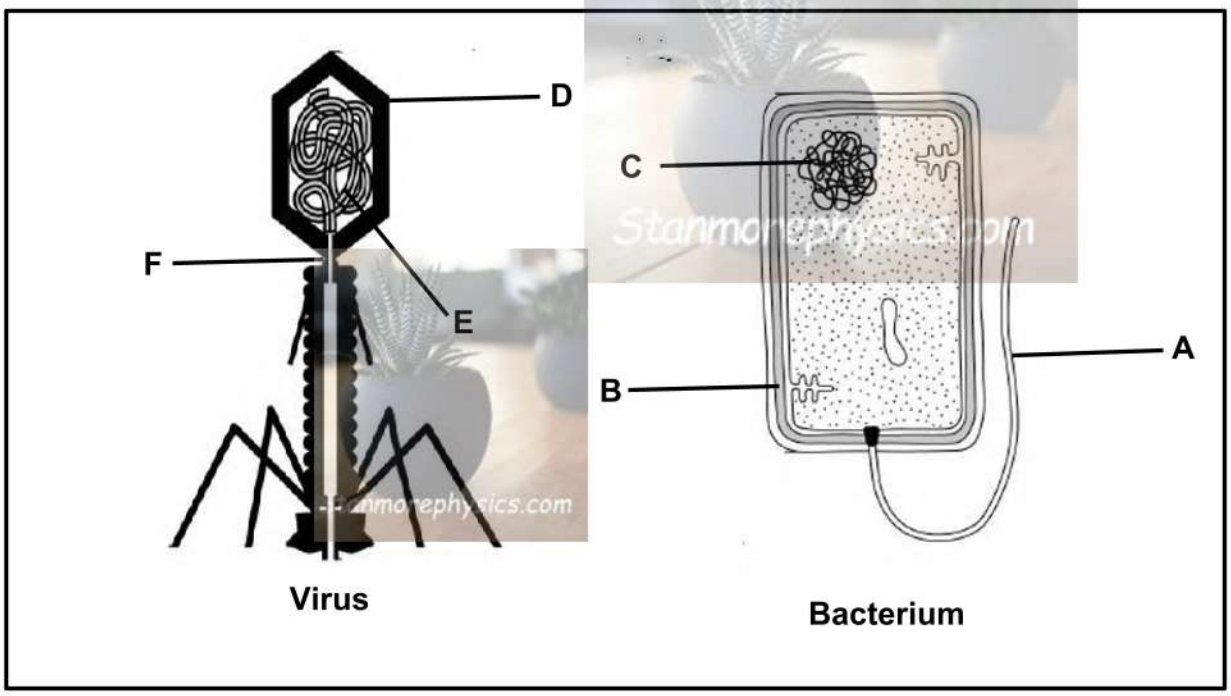
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1.4.5 Give ONE characteristic from the diagram that support your answer in QUESTION 1.4.4. (1)

1.4.6 Which plant group is more closely related to the gymnosperms? (1)

1.4.7 In which plant group does the ferns belong to? (1)
(10)

1.5 The diagrams below show the structure of a virus and a bacterium.



1.5.1 Identify part:

(a) **A** (1)

(b) **D** (1)

(c) **E** (1)

1.5.2 Give LETTERS of the parts that contain genetic information. (2)

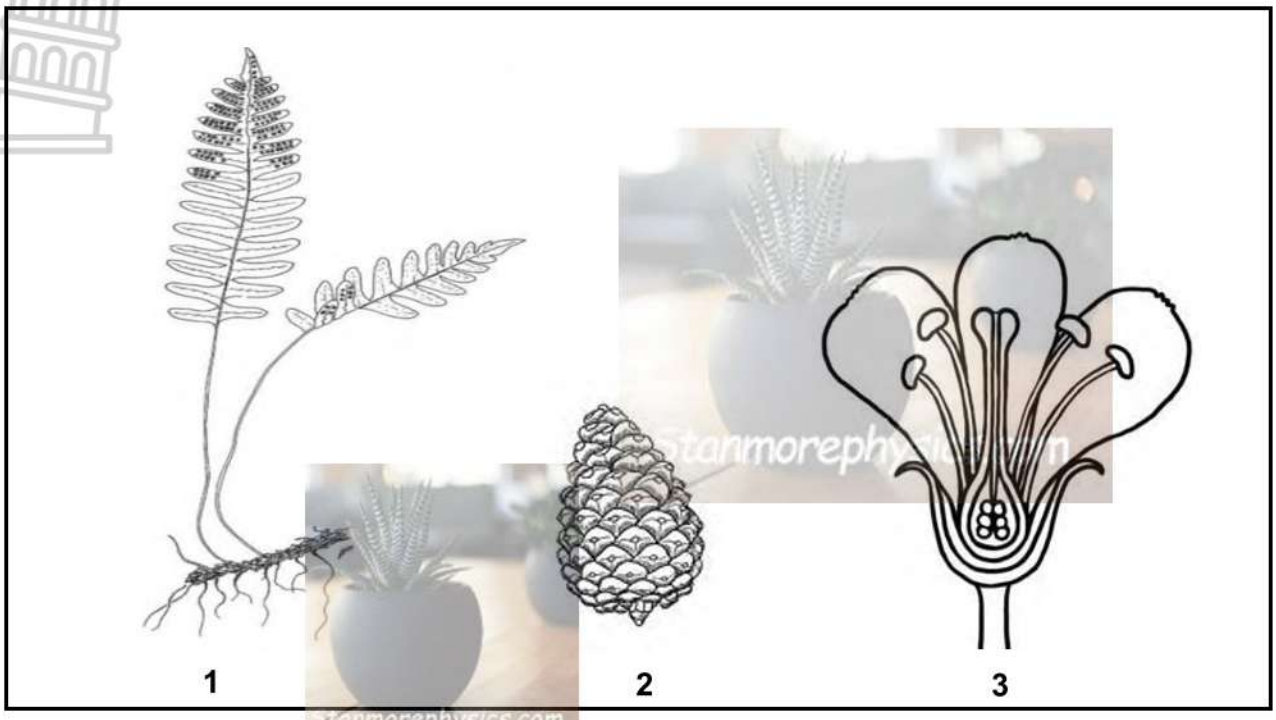
1.5.3 Give the name of the virus represented in the diagram. (1)
(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The diagrams below show the structures of different plant groups/divisions.



2.1.1 Give the scientific name of the plant group represented by diagram:

(a) 1 (1)

(b) 3 (1)

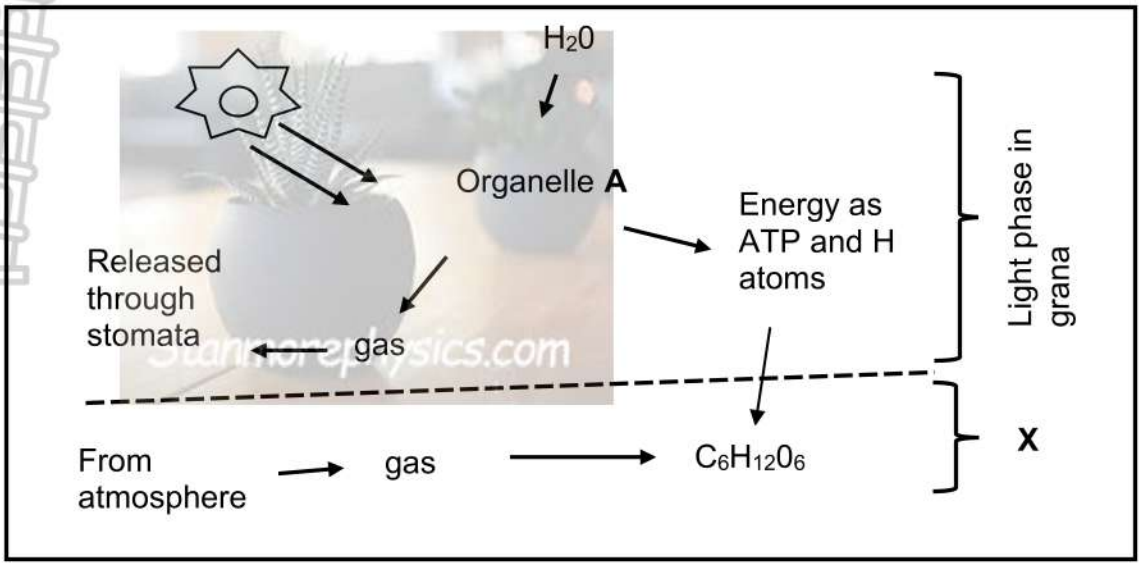
2.1.2. Name the reproductive structure in the diagram representing plant group **2**. (1)

2.1.3 Explain why plant group **3** are more dominant on earth than plant group **2**. (2)

2.1.4 Explain ONE way in which plant group **1** is structurally suited to survive on land. (2)
(7)

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2.2 The diagram below is a schematic representation of the process of photosynthesis.



2.2.1 Identify organelle **A**.: (1)

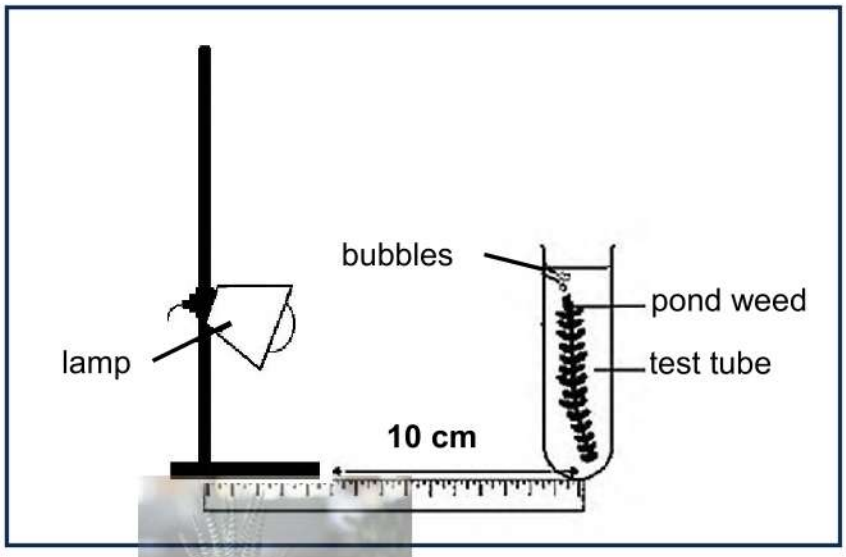
2.2.2 Name:

(a) The phase represented by **X** (1)

(b) The part of organelle **A** in which the phase in QUESTION 2.2.3.(a) takes place (1)

2.2.4 Explain THREE effects on living organisms if photosynthesis does not occur. (6)
(9)

2.3 A student investigated the effect of light intensity on the rate of photosynthesis.



The procedure was as follows:

- Set up the apparatus as shown in the diagram above
- Placed the lamp 10cm from the test tube
- Counted and recorded the number of bubbles produced in five minutes
- Repeated the procedure with the lamp at a distance of 20cm and 30cm away from the test tube
- Repeated the investigation three times at each distance
- Calculated the average number of bubbles produced at each distance The results of the investigation are shown in the table below.

Distance (cm)	Number of bubbles			
	Test 1	Test 2	Test 3	Average
10	42	37	44	41
20	23	24	22	**X**
30	10	11	12	11

2.3.1 Name the gas represented by the bubbles produced during this investigation. (1)

2.3.2 Identify the dependent variable in this investigation. (1)

2.3.3 Describe how was the dependent variable measured in this investigation. (1)

2.3.4 State THREE variables that should be kept constant to improve the results. (3)

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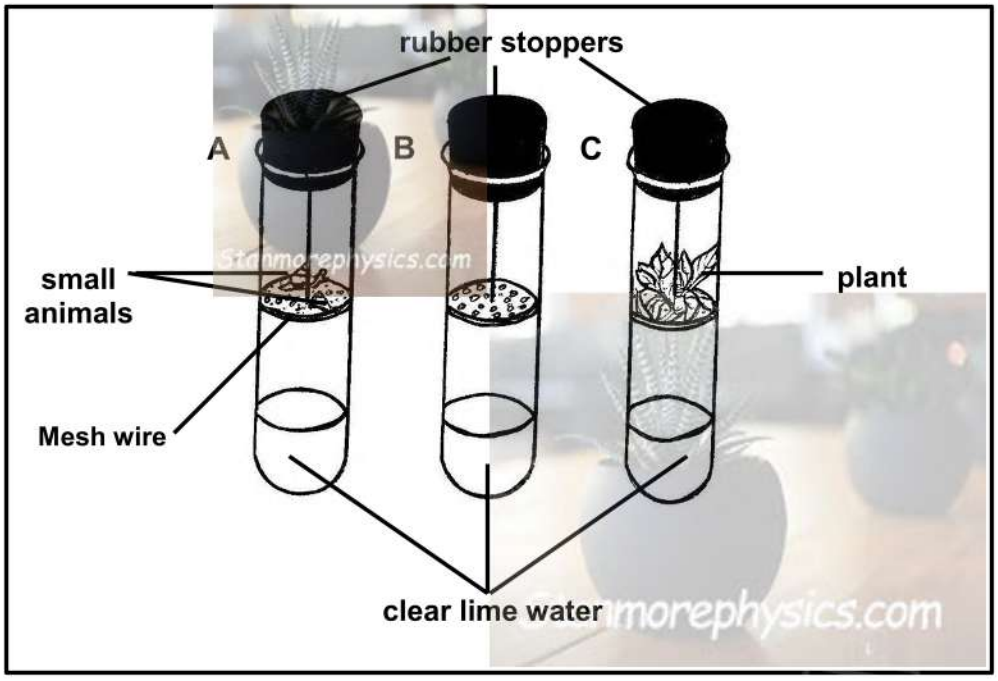
2.3.5 Calculate the average number of bubbles at **X**. (2)

2.3.6 Give a conclusion about the effect of light intensity on the rate of photosynthesis. (2)

2.3.7 Draw a bar graph to show the average number of bubbles formed at each distance. (6)
(16)

2.4 The diagram below represents the apparatus used in an investigation to determine if carbon dioxide is released during respiration. The lime water was used to test for the presence of carbon dioxide. If it remains clear, there is no carbon dioxide present. If the lime water turns milky, this indicates the presence of carbon dioxide. A mesh wire (solid wire which has very small holes) was placed above the lime water.

All the apparatus was kept in the dark.



2.4.1 Name the stage during normal respiration when carbon dioxide is released. (1)

2.4.2 State the aim of the investigation. (2)

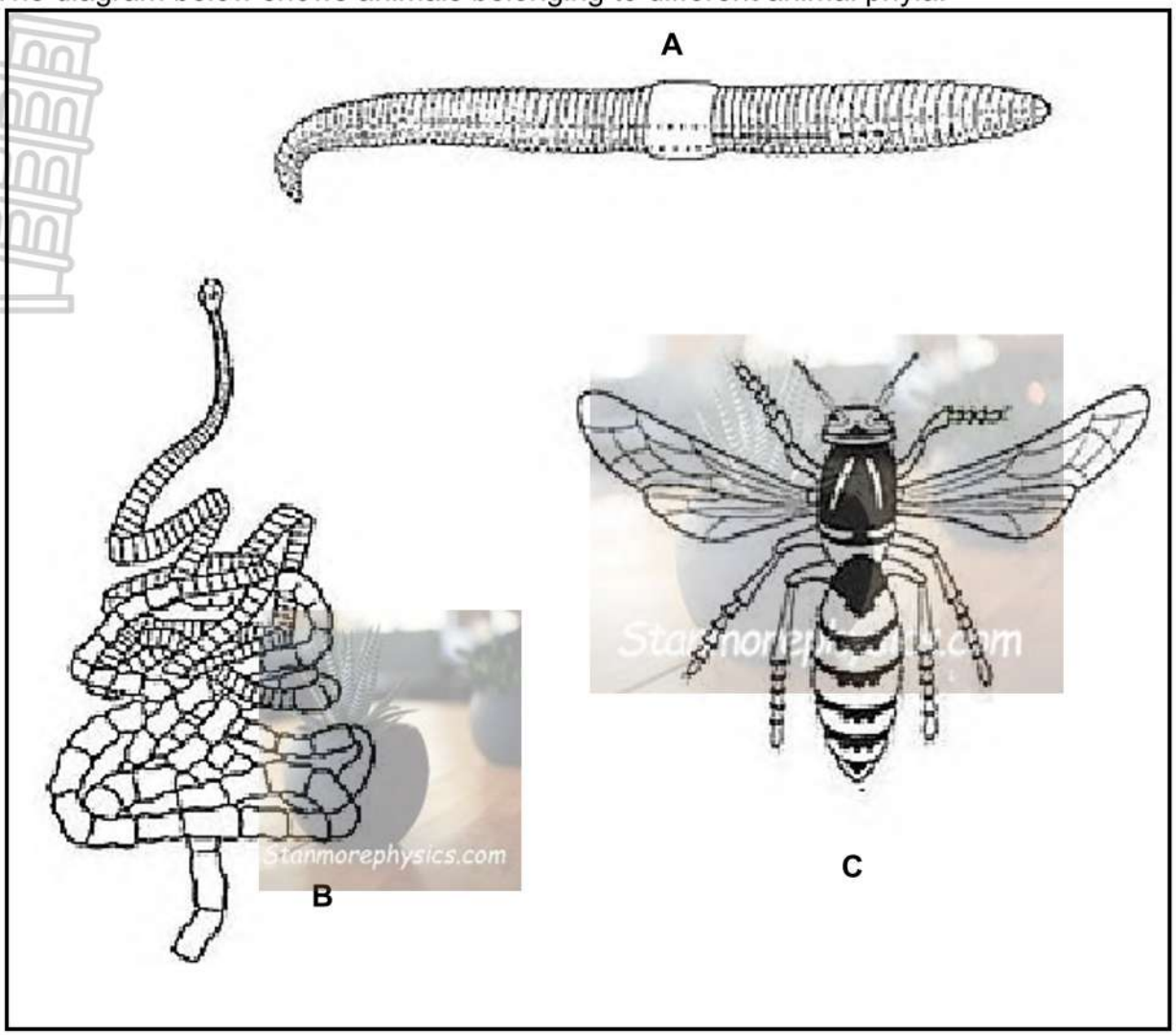
2.4.3 In this investigation, state:

(a) The purpose of the clear lime water (1)

(b) TWO reasons for using a mesh wire (2)

2.4.4 Tabulate the expected results for the investigation. (4)
(10)

2.5 The diagram below shows animals belonging to different animal phyla.



2.5.1 Give the LETTER and NAME of an organism that is classified under Platyhelminthes in the diagram. (2)

2.5.2 Explain:

(a) ONE way in which animal **A** is important in agriculture (3)

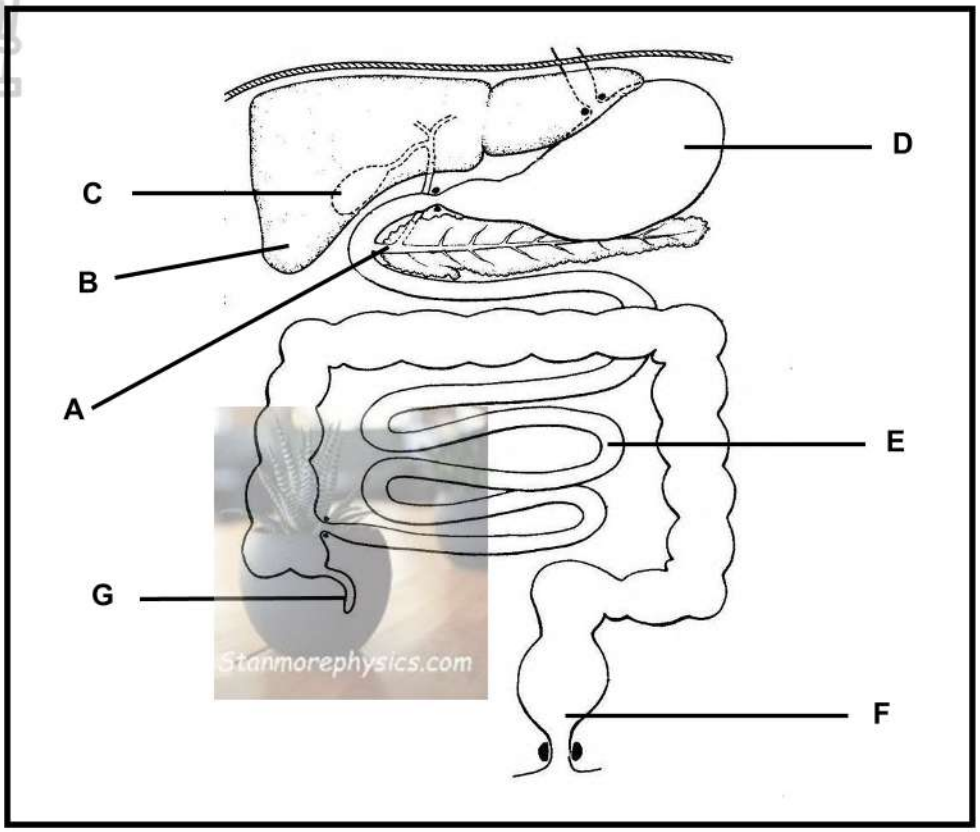
(b) How animal **C** is important in an ecosystem (3)

(8)

[50]

QUESTION 3

3.1 The diagram below represents a part of a human digestive system.



3.1.1 Identify part:

(a) **B** (1)

(b) **F** (1)

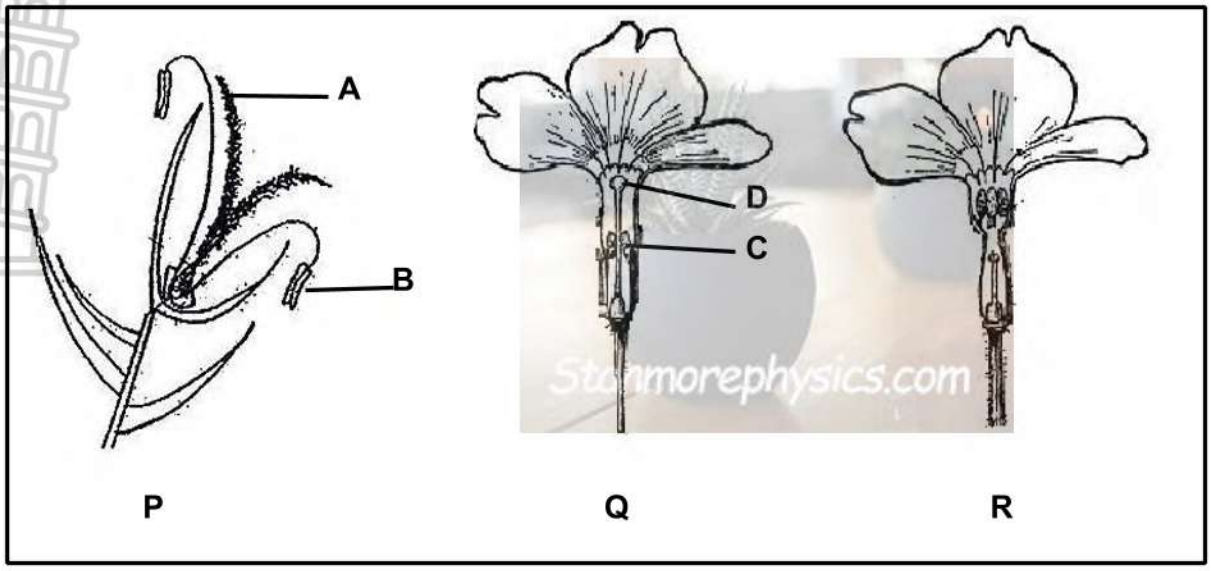
(c) **A** (1)

3.1.2 State ONE function of part **C**. (1)

3.1.3 Explain TWO ways in which part **E** is structurally suited for its function. (4)

(8)

3.2 The diagrams below represent flowers adapted to different pollinators.



3.2.1 State ONE function of part **D**. (1)

3.2.2 Identify part:

(a) **A** (1)

(b) **D** (1)

3.2.3 Which flower **P**, **Q** or **R,** is pollinated by wind? (1)

3.2.4 Give TWO visible reasons for your answer in QUESTION 3.2.3. (2)

3.2.5 Explain the significance of the arrangement of the anthers (part **C)** and part **D**. (3)
(9)

3.3 Read the extract below.

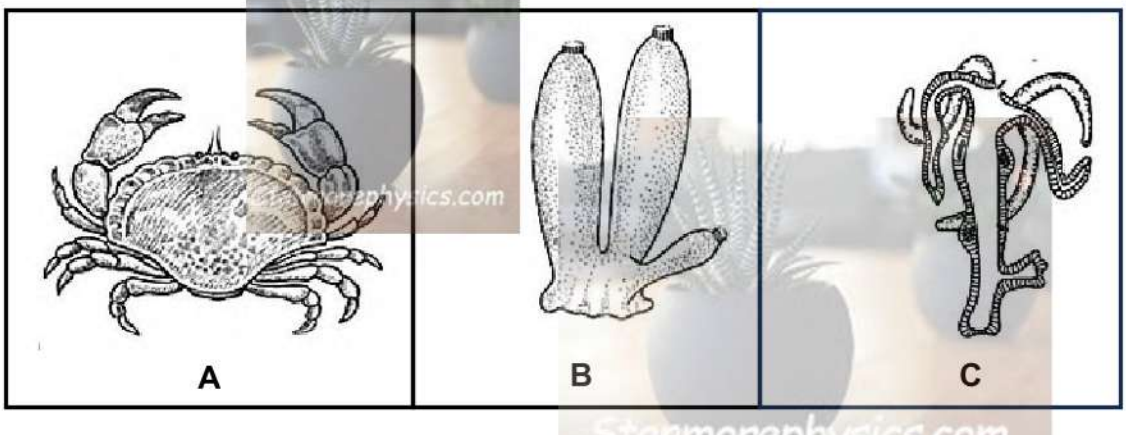
> Malaria is a disease caused by a protozoon called *Plasmodium*. It lives in the blood and liver of an infected person. Malaria can kill but more often it causes the victim to suffer from high fever, vomiting and severe headaches.

3.3.1 Give ONE symptom of malaria. (1)

3.3.2 Explain why a disease like malaria has influence on the economy of the country. (3)

3.3.3 Suggest THREE control measures that can prevent people been bitten by mosquitoes and contracting malaria. (3)
(7)

3.4 The diagrams below show three different types of animals that belong to three different phyla.



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3.4.1 Identify the phylum to which animal **A, B** and **C** belong. (3)

3.4.2 Arrange the animals in the correct order from the most primitive to the most developed. (2)

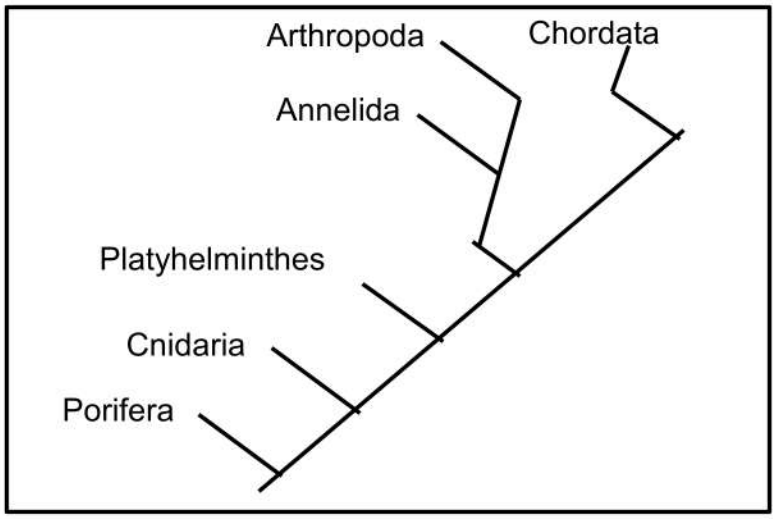
3.4.3 Which animal(s) has/have the following characteristics?

(a) No gut (1)

(b) Cephalisation (1)

(c) Radially symmetrical (1)
(8)

3.5 The diagram below shows the relationships between different animal phyla.



3.5.1 Which animal phylum shares the most recent common ancestor with the Annelida? (1)

3.5.2 Name the animal phyla possess the following characteristics with respect to their body plan:

(a) Coelom (1)

(b) Segmentation (1)

(c) Vertebral column (1)

3.5.3 Explain ONE importance of the coelom (2)

3.5.4 Describe ONE way in which the coelom of the Annelida is different to Arthropoda (2)

3.5.5 Which class of Arthropoda is mainly involved in the pollination process? (1)

3.5.6 What role does this group play in the pollination process? (2)

(11)

3.6 A learner ran for fourteen minutes around a sport field.

The table below shows data about the concentration of lactic acid in his blood.

Time from start of exercise (min)	Concentration of lactic acid in blood (mg/100 cm^3)
0	4
2	15
4	29
6	44
8	42
10	22

3.6.1 Calculate the percentage increase of lactic acid concentration from 0 to 6 minutes. (3)

3.6.2 Explain why there is an increase in lactic acid concentration during the exercise. (3)

3.6.3 The same type of respiration occurs in yeast cells.
Name the ONE product of this type of respiration in yeast cells. (1)

(7)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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