EKURHULENI NORTH DISTRICT
JUNE EXAM
2023

LIFE SCIENCES
GR 11

TIME: 2 ½ hours

MARKS: 150
12 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Draw marking margins. Do not number or write in the margins of the exam script – keep the left-hand and right-hand side of each page open.
2. Write ALL answers on the FOLIO PAPER provided.
3. Start the answers to each question (Q 1, Q 2, Q 3) at the top of a NEW page.
4. Leave a LINE OPEN between answers.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Present your answers according to the instructions of each question.
7. ALL drawings should be done in pencil and labelled in blue ink.
8. Draw diagrams or flow charts only when asked to do so.
9. The diagrams in this question paper are NOT necessarily drawn to scale.
10. You may use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.
12. Do not use correction fluid.

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 to D) next to the question number **(1.1.1 to 1.1.6)** in your **ANSWER BOOK**, for example **1.1.7 D.**

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1.1.1 Most digestion occurs in the …

A stomach.
B liver.
C small intestine.
D large intestine.

1.1.2 The following is a list that describes viruses:

(i) Play a significant role as decomposers.
(ii) Are the major pathogens of humans.
(iii) Are obligate parasites.
(iv) Reproduce within host cells.

Which of the following are of biological importance in viruses?

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

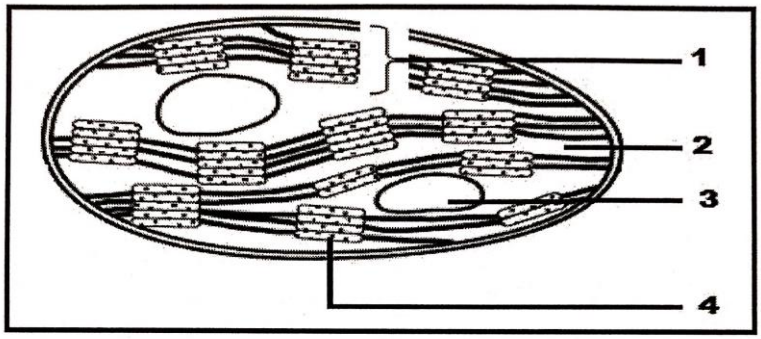
1.1.3 Binary fission is a method of reproduction that generally occurs in…

A algae.
B mosses.
C unicellular organisms.
D fungi.

1.1.4 The human body resists infection by producing …

A antigens.
B antibodies.
C mucous.
D antibiotics.

Study the following diagram of a chloroplast and answer questions 1.1.5 to 1.1.6 below:



1.1.5 Identify the place where the light phase of photosynthesis occurs.

A 1
B 2
C 3
D None of the above

1.1.6 Identify the place where the dark phase of photosynthesis occurs

A 1
B 2
C 3
D None of the above

6 x 2 = **(12)**

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 1.2.4)** in your **ANSWER BOOK**.

1.2.1 Organisms with a distinct nucleus.

1.2.2 The hyphae of bread mould responsible for spreading across a substrate.

1.2.3 The type of reproduction involving the production of spores.

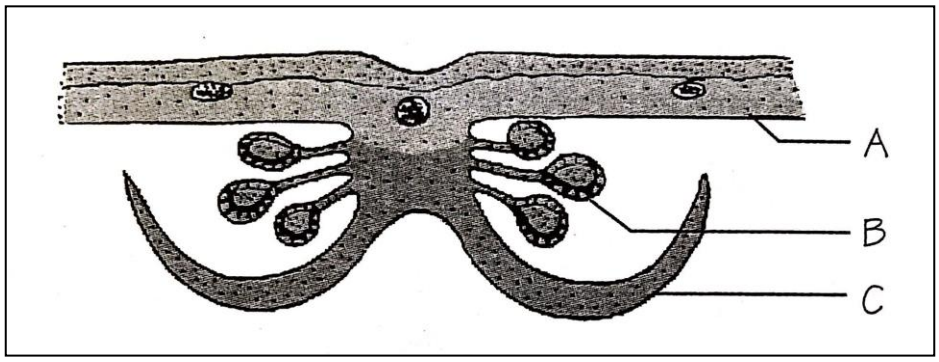
1.2.4 The form of symmetry associated with sessile animals, with a number of mirror images if sliced through the centre point. **(4)**

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 1.3.5) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	The network of filamentous threads of hyphae of bread mould.	A Mycelium B Aseptate
1.3.2	Contents of Amoeba.	A Ectoplasm B Endoplasm
1.3.3	The vector that carries the protist that causes malaria.	A Plasmodium B Female Anopheles mosquito
1.3.4	The part of a flower which develops into a seed following fertilisation.	A Ovary B Ovule
1.3.5	Having a concentration of nerve cells in the anterior (head) region.	A Bilateral symmetry B Cephalisation

(5 x 2) **(10)**

1.4 Study the diagram of a transverse section of a fern frond and then answer the questions that follow.



1.4.1 Name the division to which this plant belongs. (1)

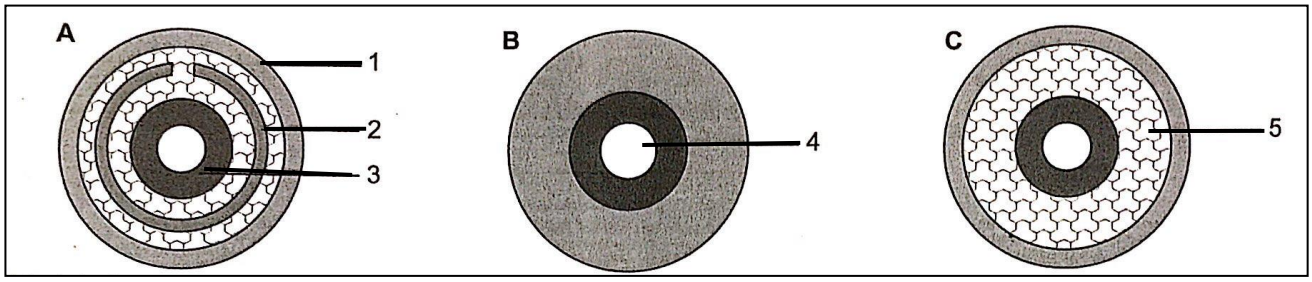
1.4.2 Provide labels for the parts marked A and B. (2)

1.4.3 State the function of the part marked C. (1)

1.4.4 a) Does this portion of the fern plant represent the sporophyte or gametophyte? (1)

b) Give a reason for your answer. (1)
(6)

1.5 Study the body walls of three organisms that you have studied and answer the questions that follow.

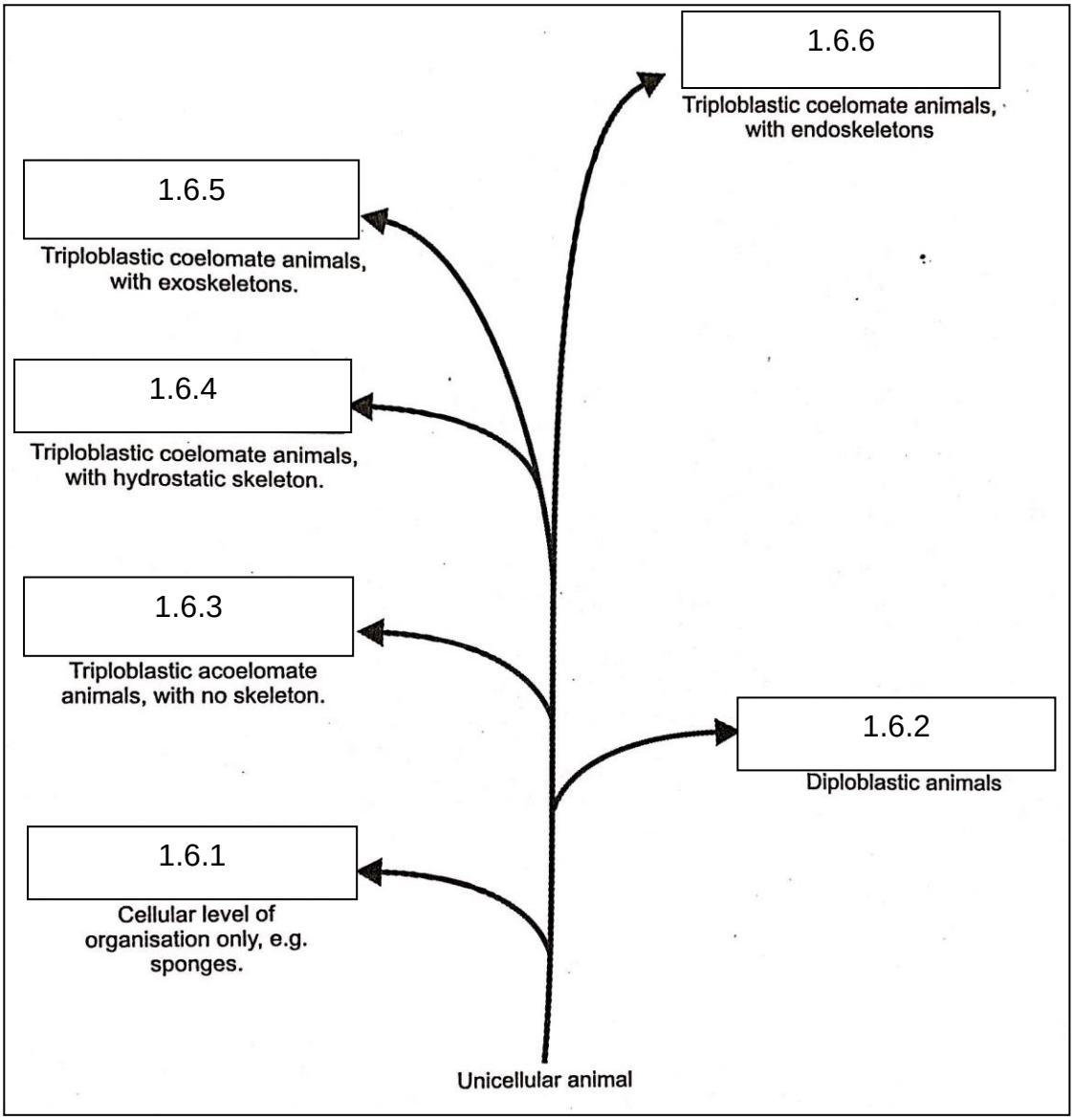


1.5.1 Provide labels for parts numbered 1 to 5. (5)

1.5.2 a) Which of A, B or C is the most highly developed organism? (1)

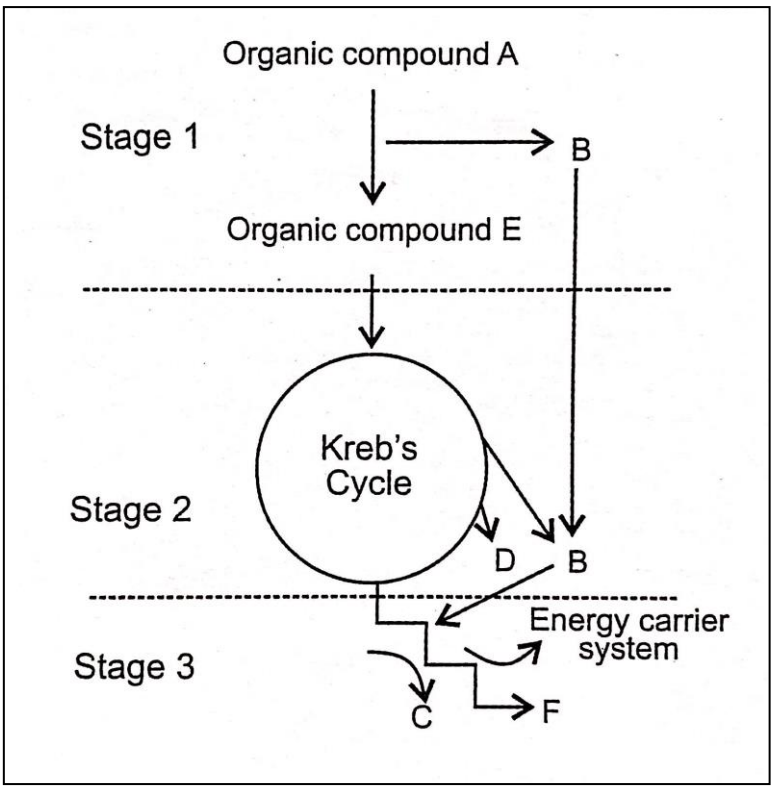
b) Provide an observable reason. (1)
(7)

1.6 Complete the phylogenetic tree below by writing the correct phylum for numbers 1.6.1 to 1.6.6.



(6)

1.7 Study the diagram of the stages of respiration below and answer the questions that follow.



1.7.1 Identify:

(a) Stage 1 (1)
(b) Stage 3 (1)
(c) The organic compound A (1)
(d) The gas D (1)

1.7.2 Where in a cell does Stage 1 occur? (1)
(5)

TOTAL SECTION A: 50

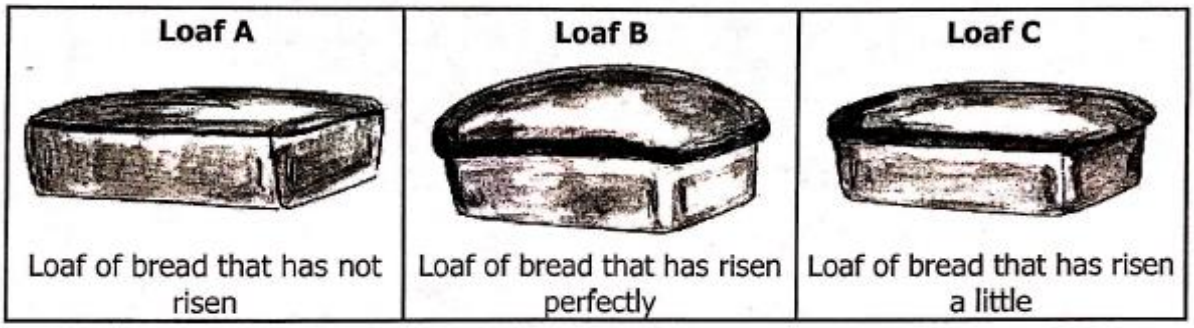
SECTION B

QUESTION 2

2.1 A baker is investigating a new recipe to make the perfect loaf of bread. The main ingredients in her dough are flour and yeast. She divides the dough into three pieces of the same size.

- Loaf A – she puts the dough into the freezer for an hour before baking.
- Loaf B – she covers the dough with a damp cloth and places it in a warm place for an hour before baking it.
- Loaf C - she covers the dough with a damp cloth and places it in the fridge for an hour before baking it.

The diagrams below show the three loaves once they have been baked.



2.1.1 Name the kingdom to which yeast belongs. (1)

2.1.2 Formulate a hypothesis for this investigation. (2)

2.1.3 Name the:
a) dependent variable (1)
b) independent variable (1)

2.1.4 What is the purpose of including loaf A in the investigation? (2)

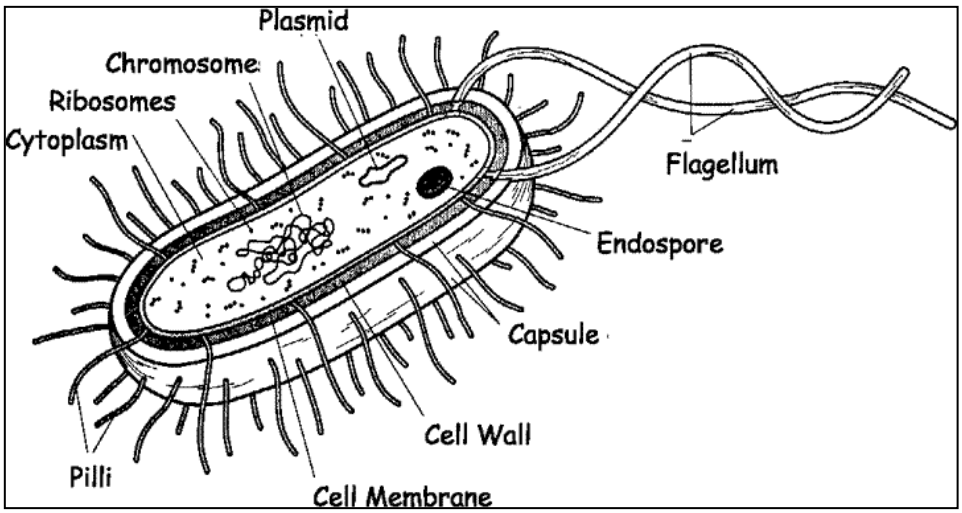
2.1.5 a) Which biochemical process occurs in the yeast when it is mixed with the dough? (1)

b) Name the substances that are produced by this process. (2)

c) Draw a labelled diagram of a mitochondrion. (6)

2.1.6 Tabulate the differences between aerobic and anaerobic respiration with regards to the raw materials required and the energy released. (7)
(23)

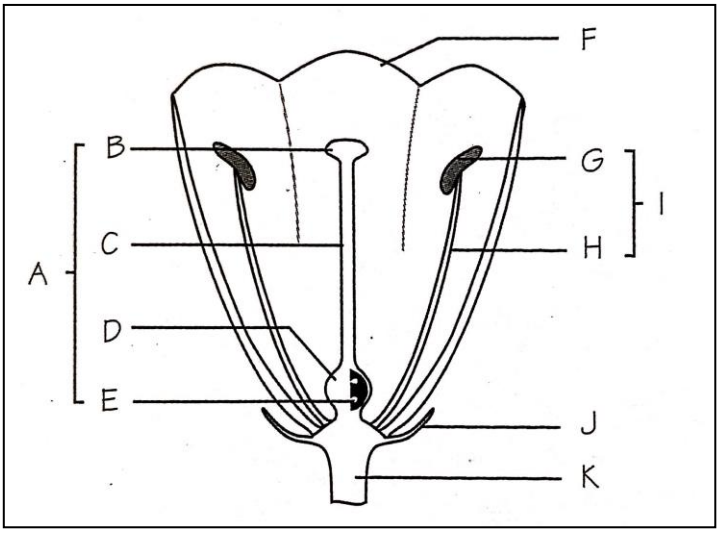
2.2 The following diagram is a typical example of a bacterium cell.



2.2.1 Discuss **TWO** examples of mutualistic relationships between bacteria and other organisms. (6)

2.2.2 Describe the role of autotrophic and saprophytic bacteria in a food chain. (4)
(10)

2.3 Study the diagram of a flower and then answer the questions that follow.



2.3.1 Give the **LETTER** of the following parts:
a) The part which produces pollen. (1)
b) The part that represents the pistil/ gynoecium. (1)
c) The part in which fertilisation occurs. (1)
d) The part which will develop into a fruit following fertilisation. (1)

2.3.2 Define pollination. (2)

2.3.3 Describe the structure of wind pollinated flowers. (4)

2.3.4 a) Does a flower reproduce sexually or asexually? (1)

b) State **TWO** advantages and **TWO** disadvantages of this type of reproduction. (4)

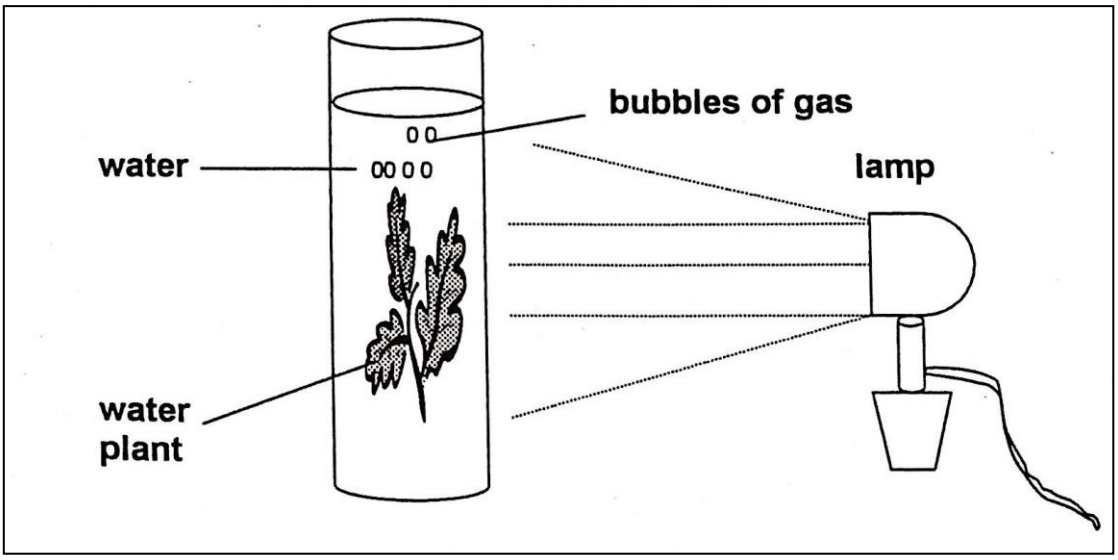
c) Explain why Angiosperms that reproduce sexually have a greater chance of survival than those that can only reproduce asexually. (2)
(17)
[50]

QUESTION 3

3.1 When light shines on a water plant, *Elodea sp.* bubbles of gas are released. The rate at which bubbles of gas are produced can be used to measure the rate of photosynthesis.

An investigation was carried out to study the effect of different colours of light on the rate of photosynthesis in *Elodea sp.*

- *Elodea* was exposed to one colour of light and left for 5 minutes before measurements were taken.
- The time taken for the release of 10 bubbles was recorded.
- The procedure was repeated using light of a different colour of equal intensity.
- The apparatus was set up as shown in the diagram below.



The results are shown in the table below:

Colour of light	Time taken to release 10 bubbles (seconds)
Violet	40
Blue	20
Green	80
Yellow	70
Red	35

3.1.1 What colour of light causes the greatest rate of photosynthesis? (1)

3.1.2 Name the gas that is produced by the water plant. (1)

3.1.3 Sometimes sodium bicarbonate is added to the water. How will this affect the investigation? (2)

3.1.4 List **THREE** planning steps that would have been put in place. (3)

3.1.5 Without modifying the apparatus, how could the reliability of the results be increased? (1)

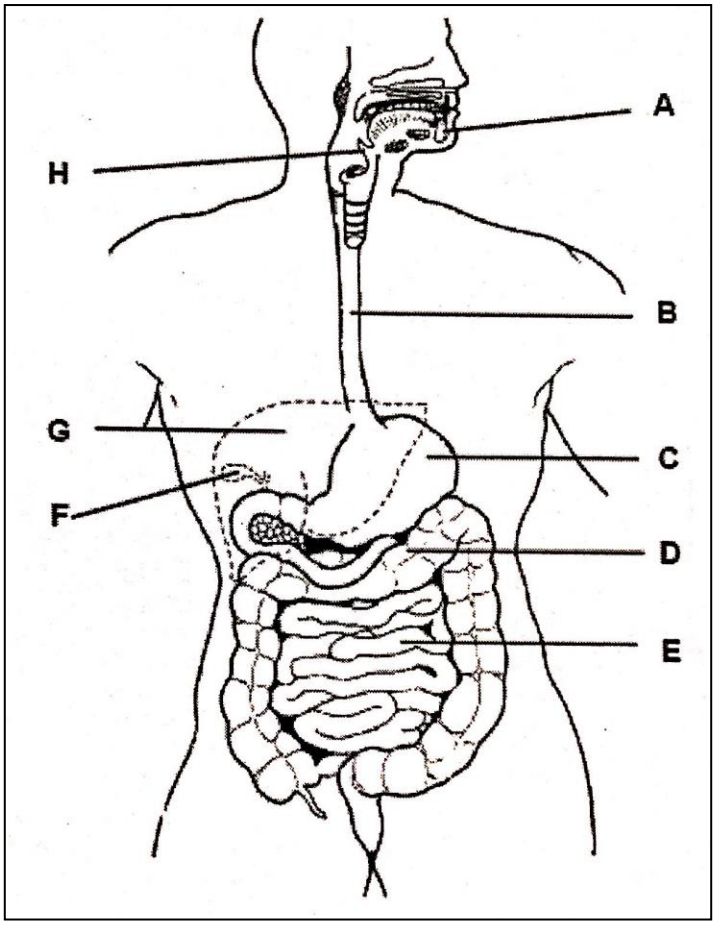
3.1.6 Calculate the percentage increase in the rate of photosynthesis between green light and red light. Show all the calculations. (3)

3.1.7 Draw a pie chart of the results shown in the table. (6)
(17)

3.2 A greenhouse is a structure built specially for the growing of plants in a controlled environment. The amount of water and nutrients that the plants receive are controlled.

Discuss three environmental conditions that can be controlled in a greenhouse to increase the rate of photosynthesis. **(6)**

3.3 Study the diagram of part of the alimentary canal and answer the questions that follow.



3.3.1 What is the difference between mechanical and chemical digestion? (4)

3.3.2 Give the LETTER and NAME of ONE structure involved with each of the following functions:

(a) Prevents choking. (2)
(b) Where chemical digestion of protein begins. (2)
(c) Where most water and mineral salts are absorbed. (2)

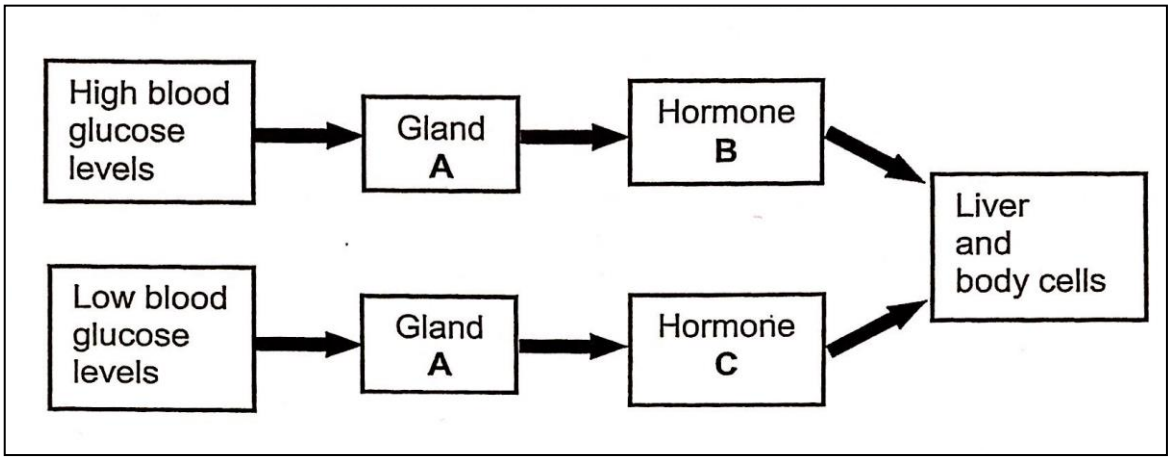
3.3.3 Explain THREE adaptations of structure E for the absorption of food. (6)

3.3.4 Name:

(a) The muscular contractions of part B. (1)
(b) The digestive juice produced by part E. (1)

3.3.5 Describe what happens to excess amino acids in the body. (3)
(21)

3.4 The diagram below shows the homeostatic control of blood glucose levels.



3.4.1 Identify:

(a) Gland A (1)

(b) Hormone C (1)

3.4.2 A certain disorder causes decreased production of hormone B.

(a) Name the disorder. (1)

(b) Explain how this will affect the blood glucose levels. (3)
(6)
[50]

TOTAL SECTION B: 100
TOTAL: 150