



# education

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**SENIOR CERTIFICATE EXAMINATION - 2005**

**BIOLOGY P1**

**STANDARD GRADE**

**OCTOBER/NOVEMBER 2005**

**Marks: 150**

**2 HOURS**

**This question paper consists of 17 pages.**



**INSTRUCTIONS AND INFORMATION TO CANDIDATES**

Read the following carefully before answering the questions:

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answer to each question at the top of a new page.
4. Number the answers exactly as the questions are numbered.
5. Write neatly and legibly.
6. If answers are not presented according to the instructions of each question candidates will lose marks.
7. All drawings should be done in pencil and labelled in ink.
8. Only draw diagrams or flow charts when requested to do so.
9. The diagrams in the question paper may not necessarily be drawn to scale.
10. The use of graph paper is NOT permitted.
11. Non-programmable calculators, protractors and compasses may be used.

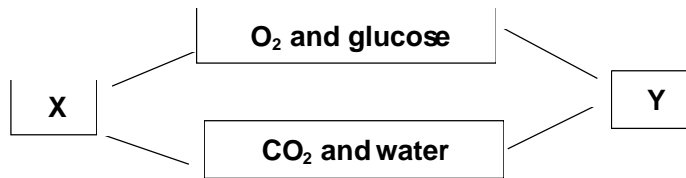


**SECTION A****QUESTION 1**

- 1.1 Various possible answers are provided for each question. Indicate the correct answer by writing only the **letter** of your choice next to the relevant question number.
- 1.1.1 The process by which harmful substances are made harmless is known as...
- A defaecation.
  - B detoxification.
  - C deoxygenation
  - D digestion.
- 1.1.2 A common role of both calcium and phosphorus is to...
- A prevent kwashiorkor in young children.
  - B synthesise proteins.
  - C assist in the clotting of blood.
  - D assist in the functioning of muscles and nerves.
- 1.1.3 Which of the following chemicals is used to test for starch?
- A Iodine solution
  - B Ether
  - C Fehling's solution
  - D Copper sulphate solution
- 1.1.4 Vitamins are required by humans...
- A to maintain normal metabolic activities.
  - B to prevent marasmus in adults.
  - C as a source of energy during cellular respiration.
  - D as a building material for body cells.



Questions 1.1.5 and 1.1.6 refer to the flow chart below.



1.1.5 Which process is represented by X and Y respectively?

	X	Y
A	Respiration	Photosynthesis
B	Transpiration	Photosynthesis
C	Photosynthesis	Respiration
D	Photosynthesis	Transpiration

1.1.6 Radiant energy is...

- A not involved in these processes.
- B needed by both X and Y.
- C needed by Y and released by X.
- D needed by X only.

(6 x 2) (12)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the **term** next to the relevant question number.

- 1.2.1 The membrane that covers the surface of the lungs
- 1.2.2 Process by which fat molecules are broken down into tiny droplets
- 1.2.3 Oxygen-carrying pigment found in red blood corpuscles
- 1.2.4 The general energy carrier in cells of living organisms
- 1.2.5 A nutrient which prevents goitre
- 1.2.6 The organ in which the process of deamination takes place
- 1.2.7 A polysaccharide which forms a structural component of cell walls
- 1.2.8 Joining of two or more organic molecules to form a larger molecule together with the formation of water

(8)



- 1.3 Match the items in COLUMN I with the statements in COLUMN II. Write only the **letter** of the correct answer next to the relevant question number.

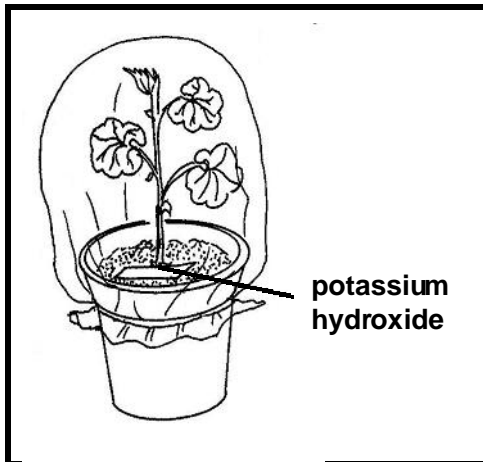
COLUMN I	COLUMN II
1.3.1 Dark phase of photosynthesis	A Rickets
1.3.2 Organelle in which aerobic respiration takes place	B Scurvy
1.3.3 A vitamin deficiency disease in children characterised by abnormal bone formation	C Epiglottis
1.3.4 The maximum number of organisms that the resources in a habitat can support	D Stroma
1.3.5 The structure which prevents food from entering the trachea during swallowing	E Mitochondrion
1.3.6 Is required for the formation of chlorophyll	F Carrying capacity
	G Chloroplast
	H Territoriality
	I Pyloric valve
	J Magnesium
	K Iodine

(6 x 2) **(12)**

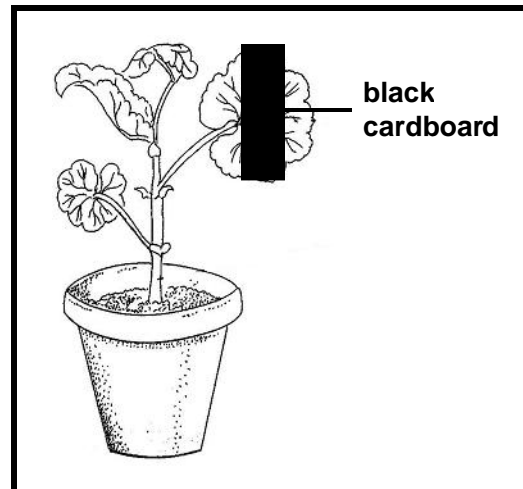


1.4 The diagrams below represent parts of apparatus used in investigations on different aspects of photosynthesis. Write down the numbers 1.4.1 to 1.4.3 in your answer book and next to each indicate the **aim** of each investigation.

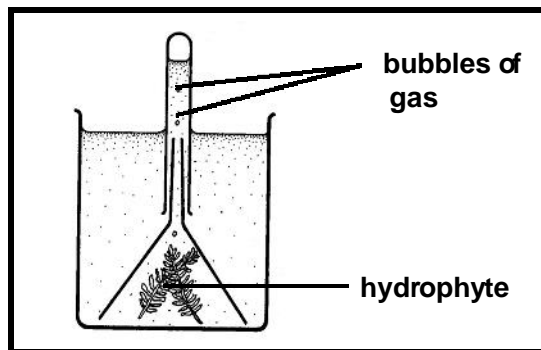
1.4.1



1.4.2



1.4.3

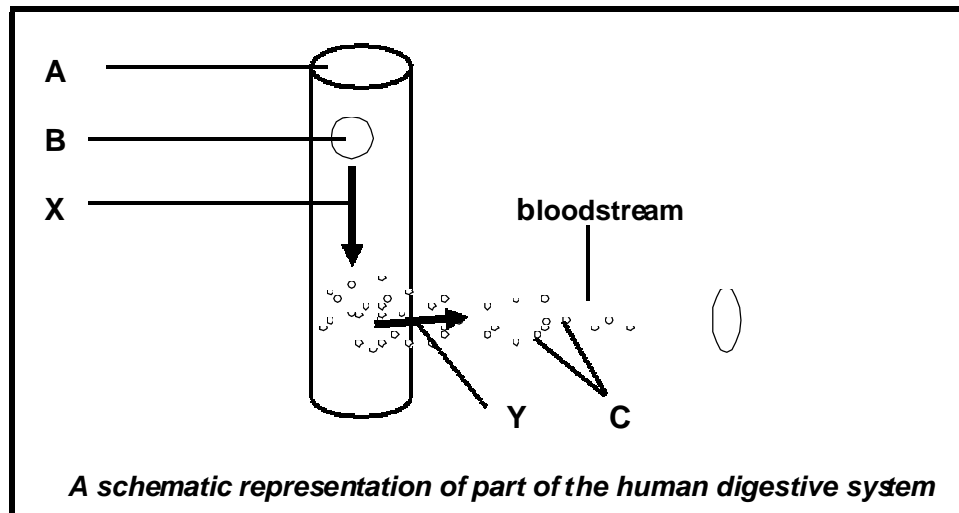


(3 x 2)

(6)



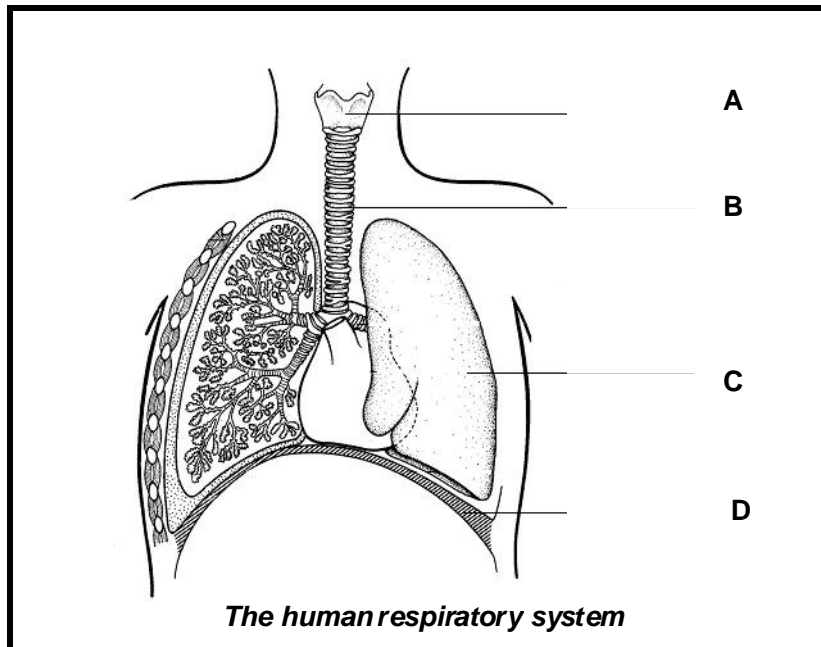
1.5 Study the diagram below and then answer the questions that follow.



- 1.5.1 Name the part of the alimentary canal that is represented by A. (1)
- 1.5.2 Identify the processes represented by the following arrows:
- (i) X (1)
- (ii) Y (1)
- 1.5.3 If B represents a protein molecule, then what substance is represented by C? (1)
- 1.5.4 List TWO functions of C, referred to in QUESTION 1.5.3, once it is absorbed into the body. (2)
- (6)**



1.6 Answer the questions based on the following diagram.



- 1.6.1 Provide labels for the parts A and D. (2)
- 1.6.2 List TWO ways in which part C represented in the diagram above, is protected. (2)
- 1.6.3 Explain ONE way in which part B is structurally adapted for its function. (2)

**(6)**

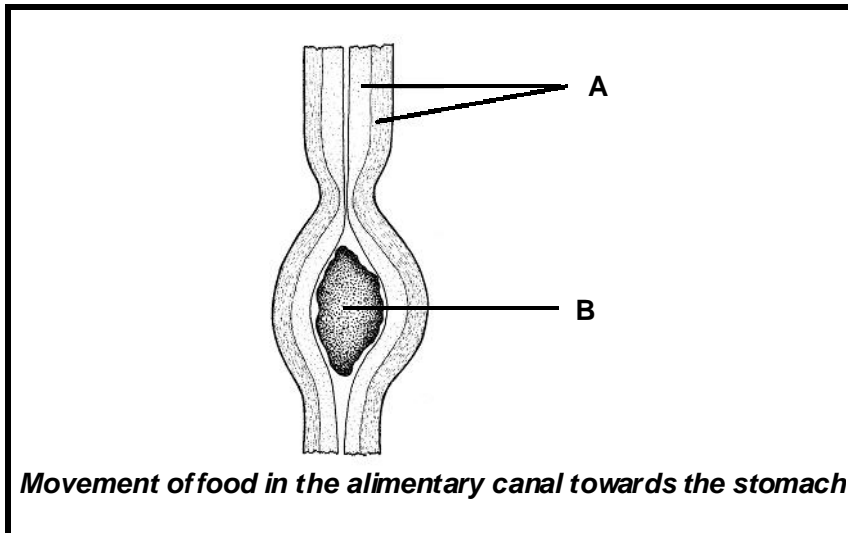
**TOTAL QUESTION 1: 50**  
**TOTAL SECTION A: 50**





**SECTION B****QUESTION 2**

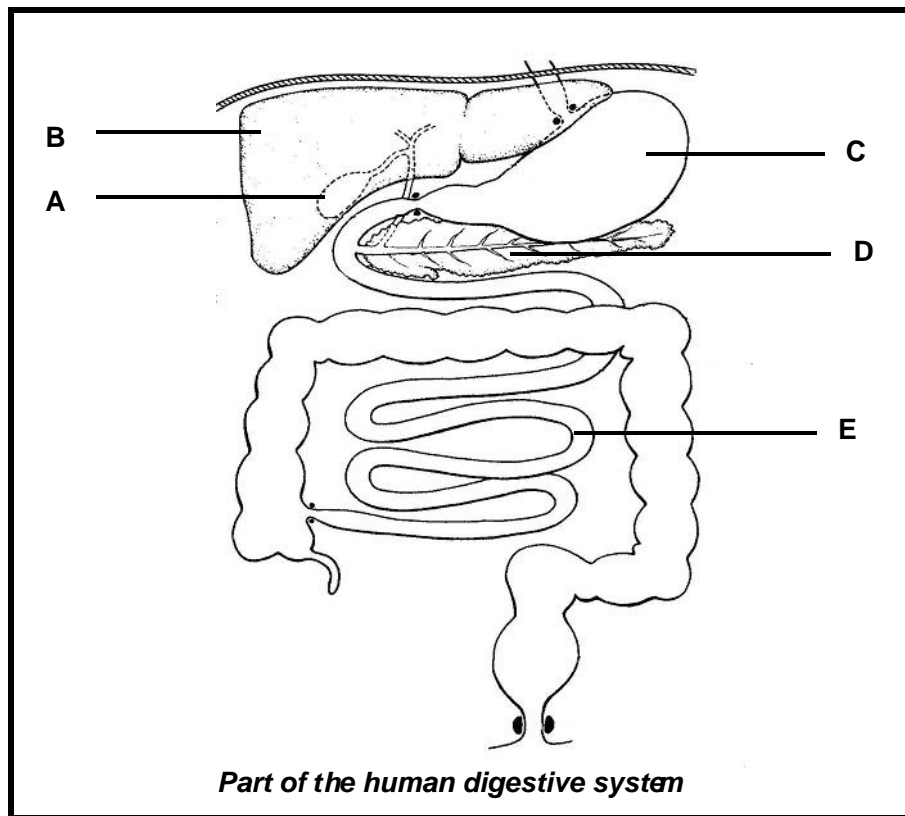
2.1 Study the diagram below and answer the questions that follow.



- 2.1.1 Identify the process shown in the diagram. (1)
- 2.1.2 Provide labels for parts A and B respectively. (2)
- 2.1.3 Explain ONE way in which the part of the alimentary canal in the diagram above is structurally suited for the process mentioned in QUESTION 2.1.1. (2)
- (5)**



2.2 Study the diagram below and then answer the questions that follow.



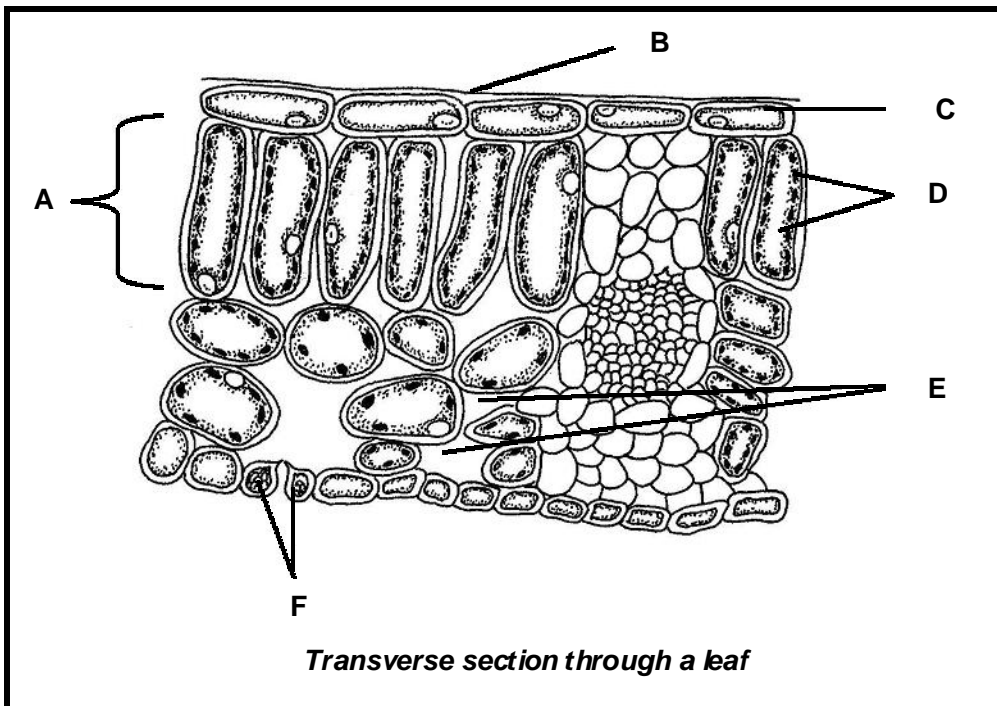
- 2.2.1 Identify parts B, C, and E respectively. (3)
- 2.2.2 List TWO functions of part B that are related to nutrition. (2)
- 2.2.3 Name the liquid that is stored in part A. (1)
- 2.2.4 State TWO ways in which the liquid named in QUESTION 2.2.3 helps in digestion. (2)
- 2.2.5 Describe the relationship between B and D in controlling the blood glucose level. (6)
- 2.2.6 Explain THREE structural adaptations of E for digestion. (6)
- (20)**

**TOTAL QUESTION 2: 25**



**QUESTION 3**

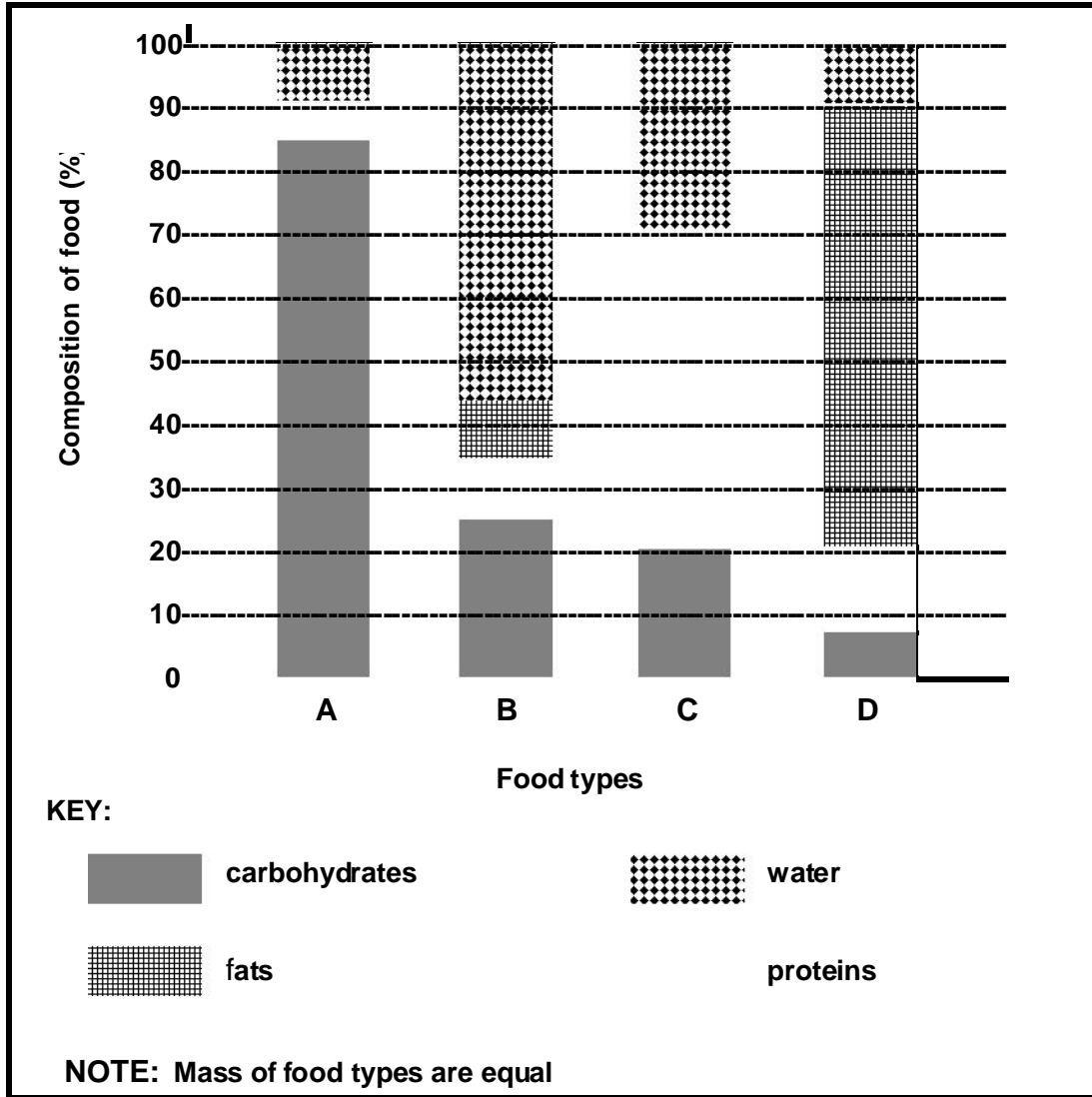
3.1 The diagram below illustrates the internal structure of a leaf. Answer the questions based on it.



- 3.1.1 Identify parts A, B, and E as well as cells C and F. (5)
- 3.1.2 State the role of each of the following for the process of photosynthesis:
- (i) B (1)
  - (ii) D (1)
  - (iii) E (1)
  - (iv) F (1)
- 3.1.3 Name TWO inorganic nutrients that are required for photosynthesis. (2)
- 3.1.4 State TWO reasons why photosynthesis is biologically important. (2)
- (13)**



3.2 Study the figure below and then answer the questions that follow.



3.2.1 Which food type:

- (i) Is most probably completely plant matter? (2)
- (ii) Consists of about 50% protein? (2)
- (iii) Is the **richest** source of energy? (2)

3.2.2 Which food will be the **most** suitable for insulation? Give an explanation for the answer. (3)

3.2.3 Which food will be the **least** suitable for the prevention of kwashiorkor? Give a reason for the answer. (3)

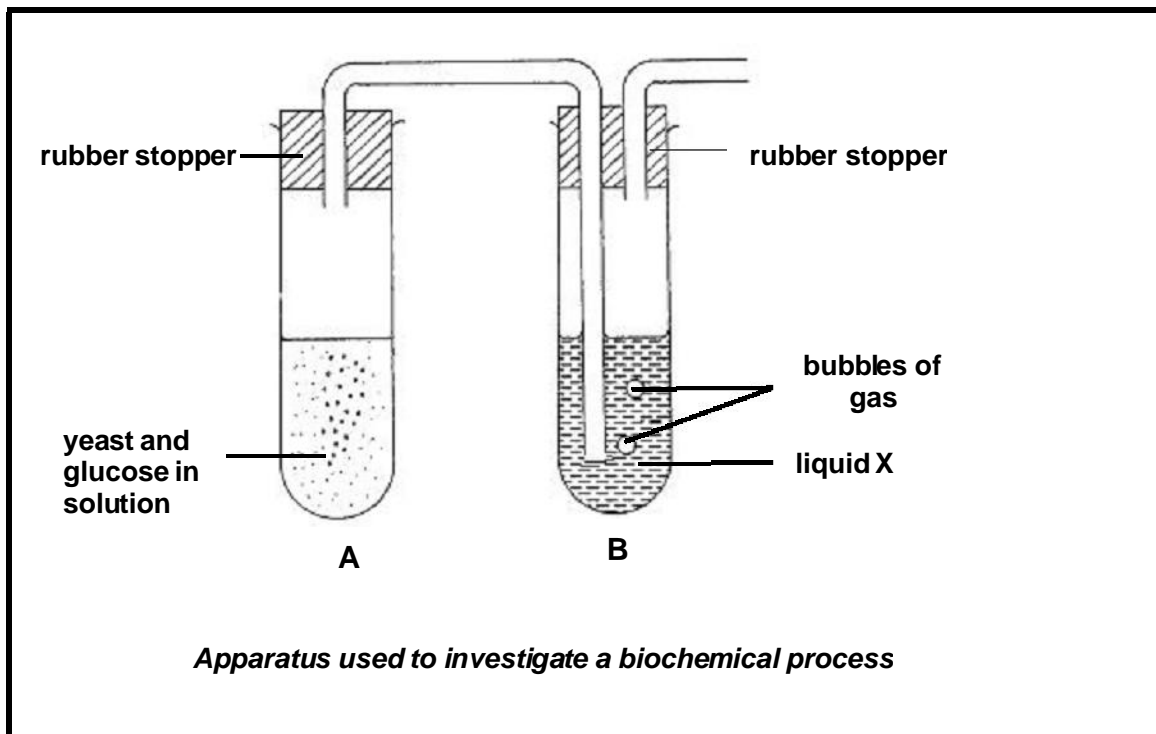
**(12)**

**TOTAL QUESTION 3: 25**



**QUESTION 4**

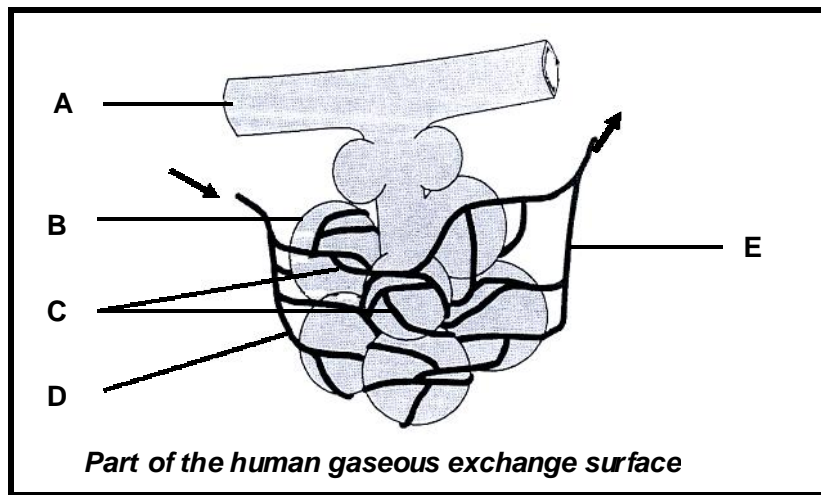
4.1 Study the diagram below and then answer the questions that follow.



- 4.1.1 State ONE function of the rubber stopper in tube A. (1)
- 4.1.2 Name:
- (i) The biochemical process that is taking place in tube A (1)
  - (ii) The bubbles of gas in tube B (1)
  - (iii) Liquid X in tube B (1)
- 4.1.3 What is the source of the food / substrate for the process mentioned in QUESTION 4.1.2 (i)? (1)
- 4.1.4 List TWO ways in which the process illustrated in the diagram is economically important. (2)
- 4.1.5 State ONE reason why it would have been better to use a thermos flask instead of a test tube. (2)
- (9)**



4.2 Study the diagram below and then answer the questions that follow.



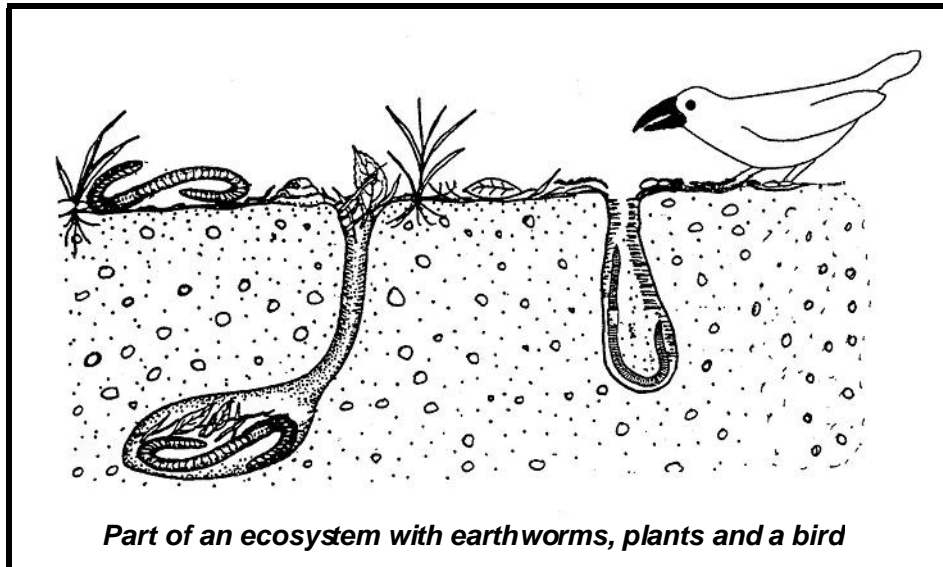
- 4.2.1 Give labels for parts A, B, and C respectively. (3)
- 4.2.2 State ONE major difference between the composition of the blood in vessel D and vessel E. (2)
- 4.2.3 List TWO features of the above structure which makes it efficient for gaseous exchange in humans. (2)
- (7)**
- 4.3 Answer the questions below based on the human gaseous exchange system.
- 4.3.1 State ONE **similarity** and ONE **difference** between the terms breathing and gaseous exchange. (3)
- 4.3.2 Describe the mechanism of exhalation. (6)
- (9)**

**TOTAL QUESTION 4: 25**



**QUESTION 5**

5.1 Study the diagram below and answer the questions that follow.



5.1.1 With reference to the diagram give ONE example of each of the following interactions:

- (i) Intraspecific competition (2)
- (ii) Predation (2)

5.1.2 Define the term population. (3)

(7)



- 5.2 Use the information in the passage and table below to answer the questions that follow.

*'Tsunamis are huge ocean waves that begin when an earthquake takes place on the seabed. In deep water, tsunamis travel almost unnoticed below the surface. However, once they reach shallow coastal waters they rear up into waves of 30 m or higher. The biggest tsunami ever recorded was a 85 m high wave which struck Japan on 24 April 1771. Tsunamis can travel along the seabed as fast as a jet plane at 700 km/h or more.'*

Earthquake-generated tsunamis			
Year	Country	Height of wave (m)	Number of deaths
1982	Japan	6,7	110
1983	Japan	7,7	104
1985	Chile	7,8	200
1993	Mexico	8,1	9 500
1995	Japan	7,6	200
1995	Japan	6,8	5 502
1999	Turkey	7,8	15 250
2003	Algeria	6,9	2 266

- 5.2.1 What causes tsunamis to occur? (1)
- 5.2.2 Why would one regard tsunamis as density-independent factors? (2)
- 5.2.3 Name any TWO other density-independent factors. (2)
- 5.2.4 State the height of the highest tsunami ever recorded. (2)
- 5.2.5 From the information given above, predict which country is most likely to experience another tsunami. Give an explanation for the prediction. (3)
- 5.2.6 In which country was the mortality rate the highest in the last 12 years? (1)

(11)





5.3 A learner wanted to know how many fish were in a dam. He caught 10 fish and marked them by clipping out a small section of their tail fin. He then released them back into the dam. A few days later he caught 20 fish, of which 5 had been marked.

5.3.1 Estimate the total number of fish in the dam by using the following formula:

$$P = \frac{F \times S}{M}$$

P = Total number of fish in the population

F = Number of fish caught and marked in the first catch

S = Number of fish caught in the second catch

M = Number of marked fish in the second catch (3)

5.3.2 Explain TWO reasons why the method used by the learner to mark the fish could result in inaccurate results. (4)  
(7)

**TOTAL QUESTION 5: 25**  
**TOTAL SECTION B: 100**

**GRAND TOTAL: 150**

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