



HILLCREST HIGH SCHOOL

Grade 11

LIFE SCIENCES JUNE 2025

MARKS: 150

TIME: 2 ½ Hours

EXAMINER: Mrs L. Prior

MODERATOR: Mrs R. Harmse

Miss E. Blom

This paper consists of 16 pages.

Instructions:

1. Answer **ALL** the questions in the answer booklet provided.
2. This paper consists of **TWO** Sections and **THREE** Questions.
3. Number the questions exactly as the questions are numbered.
4. Write neatly and legibly.
5. All drawings should be done in pencil and labelled in ink.
6. Use **ONLY** blue or black ink.
7. Non-programmable calculators, protractors and compasses may be used.
8. This paper consists of 16 pages.

SECTION A**QUESTION 1**

1.1. Various options are provided as possible answers to the following questions.
Choose the answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.8) in the ANSWER BOOK, for example 1.1.9 A.

1.1.1. Which ONE of the following animals has an exoskeleton?

- A. Sponge
- B. Earthworm
- C. Locust
- D. Porcupine

1.1.2. The collective name for a filament and an anther.

- A. pistil
- B. calyx
- C. stamen
- D. carpel

1.1.3. Which ONE of the following plant groups consists of needle leaves that reduce surface area for transpiration?

- A. Angiosperms
- B. Pteridophytes
- C. Bryophytes
- D. Gymnosperms

1.1.4. Which of the following characteristics applies to this organism?



- A. radial symmetry, diploblastic
- B. bilateral symmetry, blind gut
- C. through gut, radial symmetry
- D. cephalisation, coelom

1.1.5. During glycolysis, the glucose molecule is broken down to form

- A. pyruvic acid, ADP and an oxygen atom
- B. pyruvic acid, ADP and a hydrogen ion
- C. pyruvic acid, ATP and carbon dioxide
- D. pyruvic acid, ATP and energised hydrogen ions

1.1.6. The tissue/s that transports the products of photosynthesis to other parts of the plant.

- A. xylem and phloem
- B. xylem only
- C. phloem only
- D. sclerenchyma

1.1.7. Another name for anaerobic respiration is...

- A. Oxidation
- B. Oxidative phosphorylation
- C. Fermentation
- D. TCA Cycle

1.1.8. The general energy carrier in the cells of living organisms.

- A. ATP
- B. ADP
- C. AMP
- D. NADH

(8 x 2) (16)

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 the ANSWER BOOK.

- 1.2.1. A symbiotic relationship where both organisms benefit.
- 1.2.2. A plant that lacks true roots, stems and leaves.
- 1.2.3. Part of a seed that gives rise to shoots.
- 1.2.4. The region of the chloroplast where the dark/light independent phase of photosynthesis takes place.
- 1.2.5. The product of photosynthesis that exits through the stomata.
- 1.2.6. The phase that occurs in both aerobic and anaerobic respiration.
- 1.2.7. Group of seed-producing plants.
- 1.2.8. Phylum that consists of flatworms, such as tapeworms and parasitic flukes.

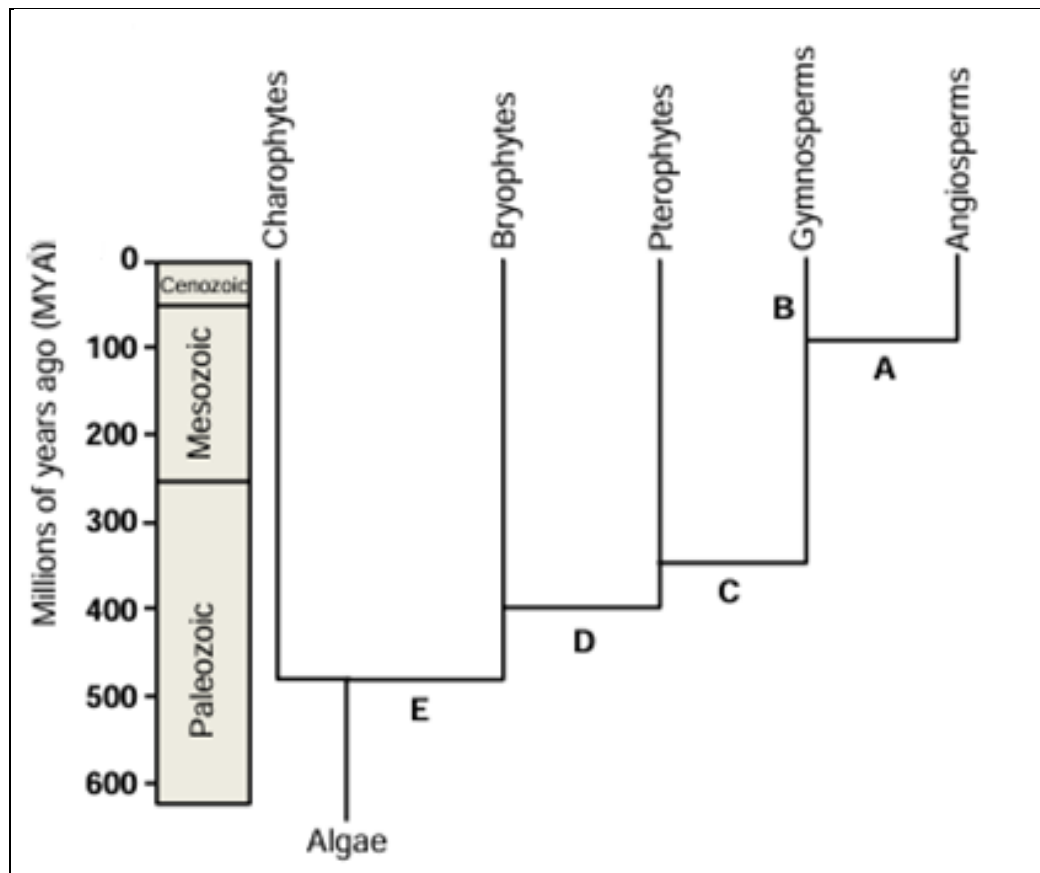
(8)

- 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 only **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: e.g. 1.3.6 B only.

COLUMN I	COLUMN II
1.3.1. Gametophyte generation is dominant.	A. Mosses
	B. Ferns
1.3.2. The male whorl of a flower.	A. gynaecium
	B. androecium
1.3.3. A fluid filled cavity located in the mesoderm.	A. mesoglea
	B. mesohyl
1.3.4. Organisms that do not have a true nucleus with a nuclear membrane.	A. Eukaryote
	B. Prokaryote
1.3.5. A characteristic of the phylum Chordata.	A. Endoskeleton
	B. Vertebral column

(5 X 2) (10)

1.4. Study the diagram below and answer the following questions:



1.4.1. Name the kingdom to which the above organisms belong. (1)

1.4.2. How many million years ago did seed plants arise on earth? (1)

1.4.3. Which LETTERS represent the following characteristics?

(a) Fruit (1)

(b) Vascular tissue (1)

1.4.4. Name the plant divisions that were found on earth during the Paleozoic era. (2)

1.4.5. Give the scientific name for the plant division in which cycads are found. (1)

(7)

1.5. Study the diagrams below representing three different phyla from the animal kingdom.



DIAGRAM A



DIAGRAM B

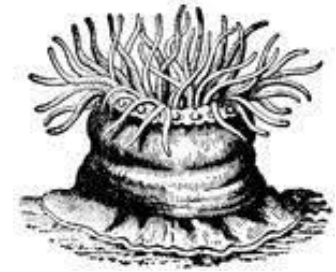


DIAGRAM C

1.5.1. Name the phyla to which the organism in Diagram **B** belongs. (1)

1.5.2. Provide the LETTER of the organism that:

(a) has a blind gut (1)

(b) shows cephalisation (1)

(c) is asymmetrical (1)

1.5.3. Draw a simple labelled diagram of a cross section through the body wall to show the tissue layers found in Diagram **C**. (3)

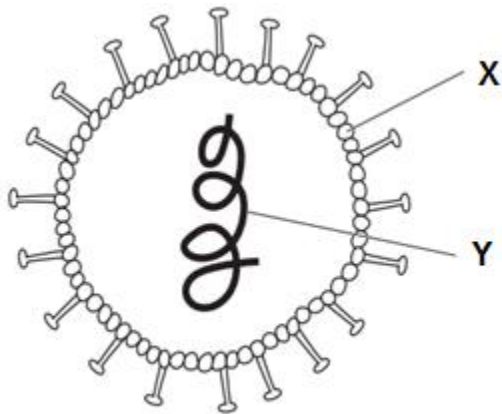
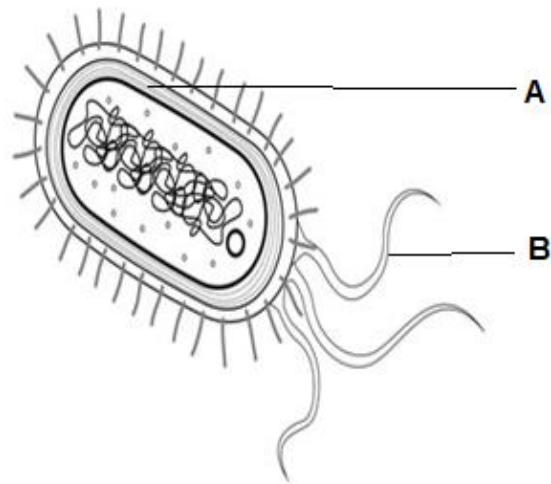
1.5.4. List TWO characteristics of the organism in Diagram **A**. (2)

(9)

SECTION A: Q1: (50)

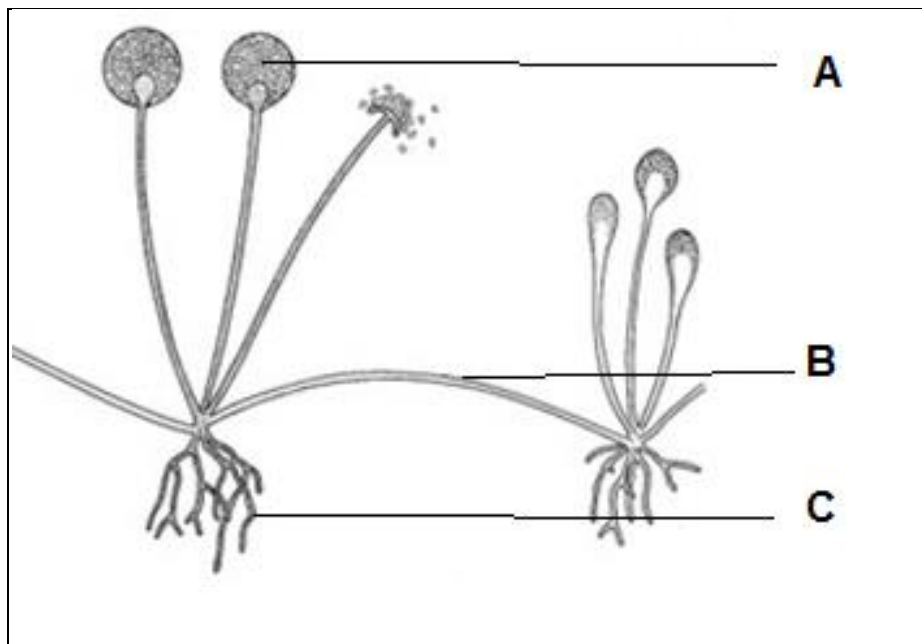
SECTION B**QUESTION 2**

2.1. Study the diagrams below of two micro-organisms and answer the questions that follow:

**DIAGRAM A****DIAGRAM B**

- 2.1.1. Identify which diagram represents a bacterium. (1)
- 2.1.2. Provide labels for parts:
- (a) **X** (1)
- (b) **B** (1)
- 2.1.3. Discuss the function of the part labelled **Y**. (2)
- 2.1.4. Name the substance that part **A** is composed of. (1)
- 2.1.5. Define the term *passive immunity*. (2)
- 2.1.6. List **TWO** ways in which micro-organisms are prevented from entering the human body. (2)
- 2.1.7. Micro-organism **A** causes measles, explain how your immune system responds to an infection of this disease. (2)
- (12)**

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



2.2.1. Identify the species represented in the diagram above.

Write down its scientific name.

(1)

2.2.2. Provide labels for parts:

(a) **A**

(1)

(b) **B**

(1)

2.2.3. State the function of the part labelled **C**.

(1)

2.2.4. Discuss ONE biological importance of the organism above.

(2)

2.2.5. Name ONE condition needed for this organism to grow.

(2)

(7)

2.3. Read the following extract below and answer the following questions:

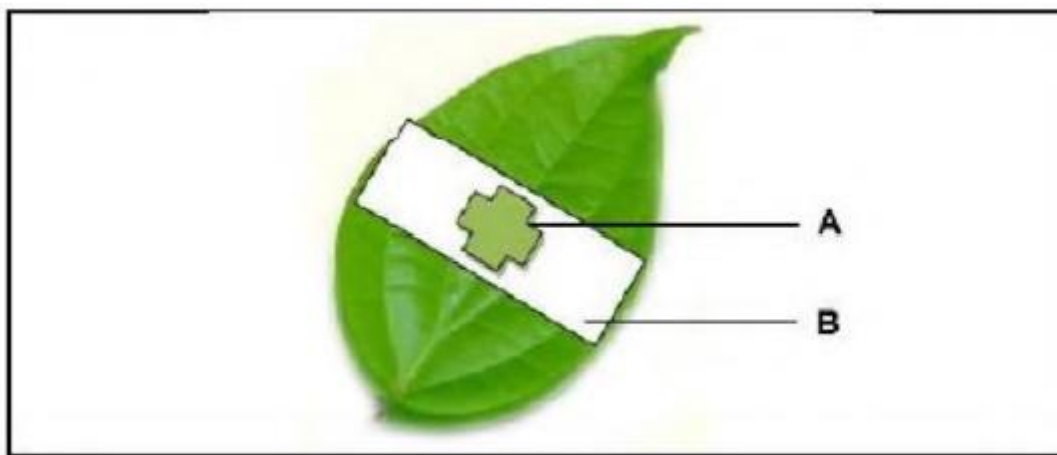
Malaria is a life-threatening disease spread to humans by some types of mosquitoes. It is mostly found in tropical countries. It is preventable and curable.

According to the latest World malaria report, there were 263 million cases of malaria in 2023 compared to 252 million cases in 2022. The estimated number of malaria deaths stood at 597 000 in 2023 compared to 600 000 in 2022.

Adopted from World Health Organization: 11 December 2024

- 2.3.1 Name the micro-organism that causes malaria. (1)
- 2.3.2. State one way in which this disease can be prevented. (1)
- 2.3.3. Calculate the percentage decrease of malaria cases from 2022 to 2023. (3)
- 2.3.4. Explain why malaria is found to affect humans mostly in tropical countries. (2)
- (7)**

2.4. The diagram below shows how the leaf in a destarched plant was set up by a learner to perform an experiment on photosynthesis. Study the diagram and answer the questions below.



- 2.4.1 Write down the AIM for this experiment. (2)
- 2.4.2 Identify the dependent variable. (1)
- 2.4.3. Explain what is meant by a 'destarched plant'. (2)

2.4.4 State the purpose of using the following in conducting a starch test:

- (a) ethanol (1)
 (b) iodine (1)

2.4.5. Make a labelled diagram showing the result of areas **A** and **B** after the starch test was done. (3)

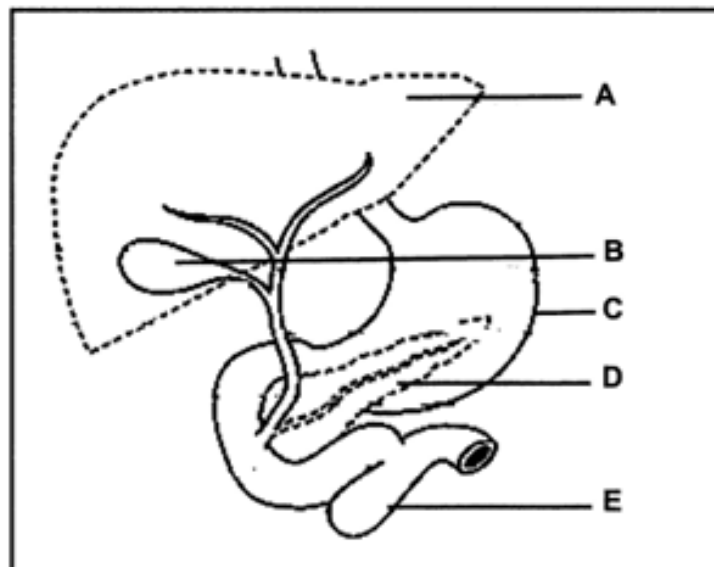
2.4.6. State ONE way the reliability of the experiment can be increased. (1)

2.4.7. State whether the area labelled **A** or **B** is the control. (1)

2.4.8. Give a reason for having a control in this experiment. (2)

(14)

2.5. Study the diagram below that shows part of the human digestive system.



2.5.1. Write down the LETTER and NAME of the part that produces:

- (a) the digestive juice that emulsifies fats (2)
 (b) gastric juice (2)

2.5.2. List TWO functions of the part labelled **A**. (2)

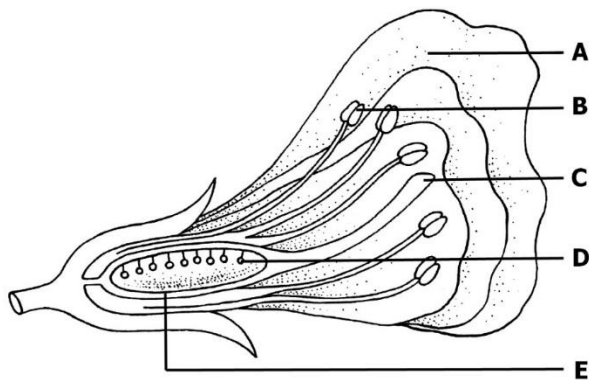
2.5.3. Name the digestive process that occurs in the part labelled **E**. (1)

2.5.4. Explain why the organ labelled **D** is both an exocrine and endocrine gland. (3)
(10)

QUESTION 2: (50)

QUESTION THREE:

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

**FLOWER 1****FLOWER 2**

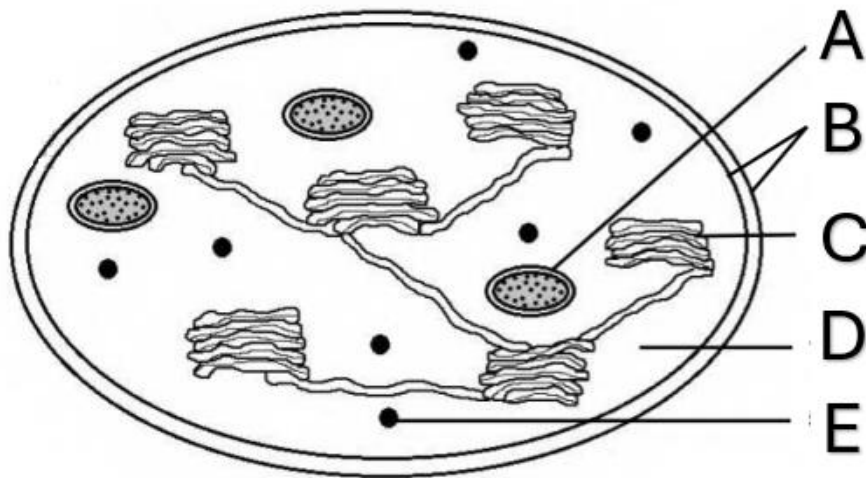
- 3.1.1. Name the division to which flowering plants belong. (1)
- 3.1.2. Identify the parts labelled:
- (a) **C** (1)
- (b) **D** (1)
- 3.1.3. Give the function of the part labelled **B**. (1)
- 3.1.4. Provide the LETTER of the part that forms the corolla. (1)
- 3.1.5. (a) Identify the type of pollination seen in flower **2**. (1)
- (b) Give TWO visible reasons for your answer to QUESTION 3.1.5 a). (2)
- 3.1.6. What will happen to **E** after fertilisation has taken place? (1)
- 3.1.7. (a) Name the type of reproduction that occurs within flowers. (1)
- (b) Discuss TWO advantages of this type of reproduction in flowers. (2)
- (12)**

3.2. Study the table of the results obtained from a man's oxygen uptake before and during an intense workout on a rowing machine. He **started** his exercise at 5 minutes and ended his exercise at 20 minutes.

TIME (mins)	OXYGEN CONSUMPTION (dm ³ /m)
0	0,2
5	0,25
10	2,2
15	2,3
20	2.5

- 3.2.1. Identify the independent variable. (1)
- 3.2.2. Plot a LINE GRAPH showing the results obtained from the table. (6)
- 3.2.3. Calculate the difference in the man's oxygen consumption from the start and end of his exercise workout. (2)
- 3.2.4. Explain why there is a steep increase in the man's oxygen consumption between 5 and 9 minutes. (1)
- 3.2.5. Tabulate TWO differences between anaerobic and aerobic respiration. (5)
- (15)**

3.3. The diagram below represents an organelle.



3.3.1. Identify the organelle shown above. (1)

3.3.2. Give the LETTER of the part that:

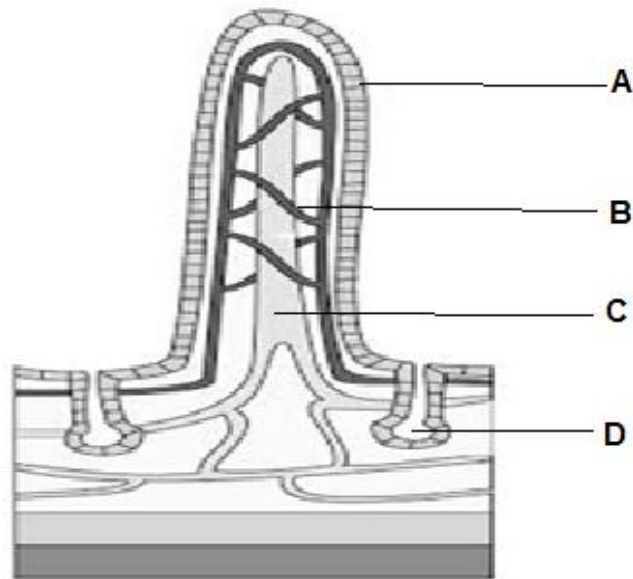
a) Stores the products of photosynthesis. (1)

b) Is the site of protein synthesis. (1)

3.3.3. Describe the light phase of photosynthesis. (4)

(7)

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



3.4.1. Identify the structure in the diagram above. (1)

3.4.2. Name the following parts of this structure:

a) Epithelium labelled **A** (1)

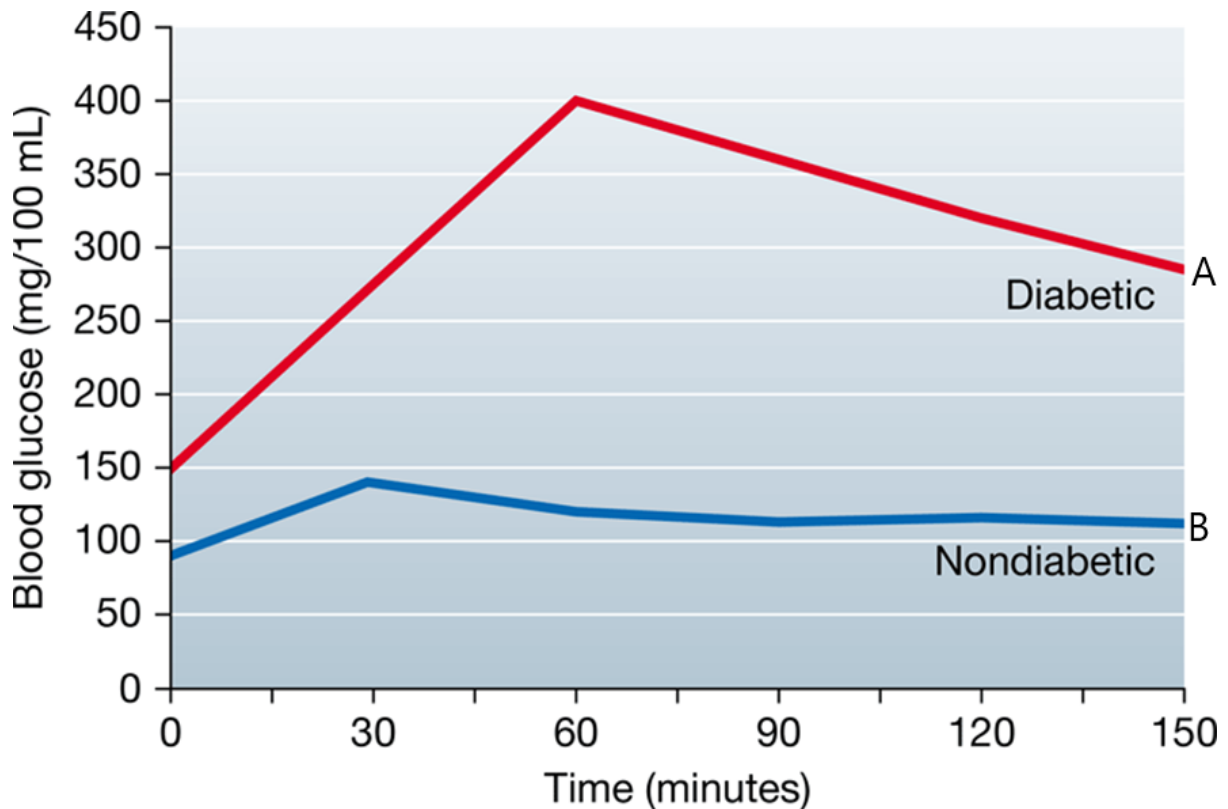
b) Vessel labelled **C** (1)

3.4.3. List the products of digestion which are absorbed at **B**. (2)

3.4.4. Write down the function of the gland labelled **D**. (1)

(6)

- 3.5. The graph below shows the changes in the blood glucose levels of a diabetic, Graph A and a nondiabetic person, Graph B after a carbohydrate rich meal.



- 3.5.1. State the amount of glucose that was present in the diabetic person's blood before the meal. (1)
- 3.5.2. Account for the fact that the glucose level spikes considerably in the diabetic person as seen in Graph A, after the carbohydrate rich meal. (2)
- 3.5.3. Calculate the difference in blood glucose levels of the diabetic and nondiabetic person's blood after 1 hour. Show ALL your working. (2)
- 3.5.4. Explain fully how normal blood glucose levels are restored after 30 minutes in the nondiabetic person's blood, as seen in Graph B. (5)

(10)

QUESTION 3: (50)

TOTAL SECTION B: 100
GRAND TOTAL: 150