Education and Sport Development

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NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 11

LIFE SCIENCES

JUNE 2018 EXAMINATION

MARKS: 150

TIME: 2.5 hours

This question paper consists of 13 pages.

Demo

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in your 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. ALL drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams 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 may use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.

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 1.1.10) in your ANSWER BOOK, for example 1.1.11 D.

1.1.1 The chemical digestion of proteins in humans starts in the...

A mouth
B oesophagus
C stomach
D small intestine.

1.1.2 A sporangium has the following characteristics:

A It produces spores; it is in the sporophyte generation and is therefore haploid.
B It produces gametes; it is in the gametophyte generation and is therefore haploid
C It produces gametes; it is in the sporophyte generation and is therefore diploid
D It produces spores; it is in the sporophyte generation and is therefore diploid.

1.1.3 The event that leads from the haploid stage to the diploid stage in alternation of generations:

A Germination
B Fertilisation
C Meiosis
D Mitosis

.

1.1.4 If all the green plants in the world were destroyed, the atmospheric gas that would increase would be….

A oxygen
B nitrogen
C carbon dioxide
D hydrogen

1.1.5 The breakdown of glucose in the presence of oxygen in living cells is called …

A aerobic respiration
B breathing
C anaerobic respiration
D gaseous exchange

1.1.6 Which of the following substances will increase inside a muscle cell during strenuous exercise?

A ATP
B glucose
C alcohol
D lactic acid

1.1.7 The arthropods that have been linked to the spread of cholera are..

A mosquito's
B spiders
C ticks
D flies

1.1.8 The four basic structural parts of most flowers are ...

A petals, sepals, pistils and stamens.
B calyx, corolla, ovules and pollen.
C stamens, pistils, pollen and seeds.
D petals, stamens, cotyledons and pistils.

1.1.9 All viruses are …

A Unicellular and disease-causing
B Acellular and non-living
C Eukaryotes
D Cellular in structure

1.1.10 Listed are stages in the test for the presence of starch in green plants.

W – Rinse the leaves thoroughly with water
X – Boil the leaves in water for 2 minutes
Y – Immense the leaves in iodine solution
Z – Boil the leaves in alcohol

Which of the following gives the stages in the correct sequence?

A W → Y → Z → X
B Y → X → Z → W
C X → Z → Y → W
D X → Z → W → Y

(2x10) **(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 1.2.6) in your ANSWER BOOK.

1.2.1 The removal of the amino group from amino acid in the liver

1.2.2 Structure of the flower that supports the stigma.

1.2.3 The phase of breathing that is accompanied by an increase in the volume of the chest cavity

1.2.4 The protective membrane surrounding the lungs

1.2.5 Small flap that closes the opening to the trachea during swallowing.

1.2.6 The type respiration that occurs in the absence of oxygen.

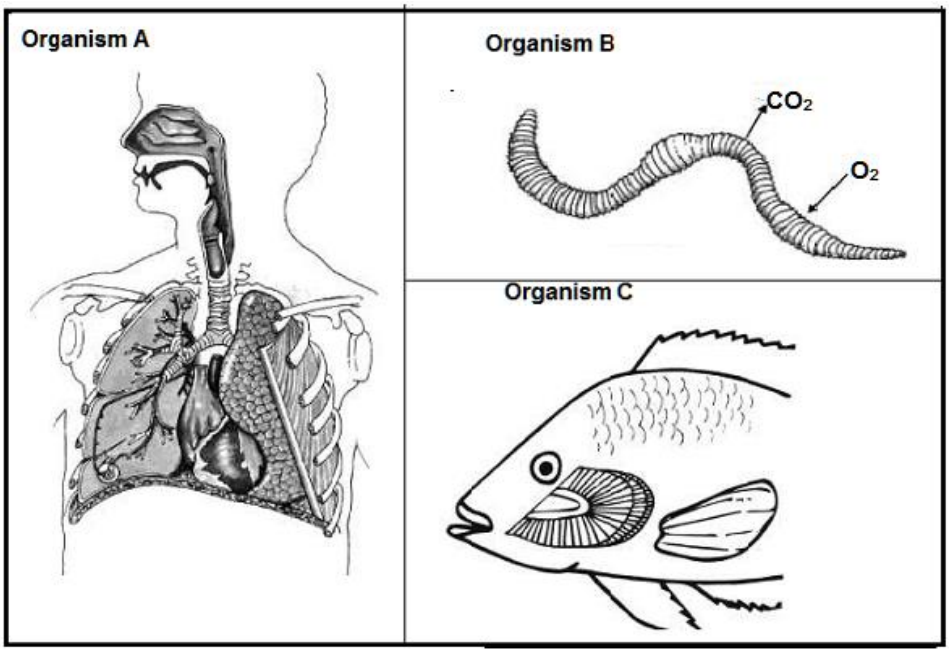
(1x6) **(6)**

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 to1.3.6) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	Dominant generation in the life-cycle of Bryophytes	A: Gametophyte B: Sporophyte
1.3.2	Produced when glucose is broken down completely	A: Lactic acid B: Ethanol
1.3.3	Process by which digested food becomes part of the body	A: Assimilation B: Detoxification
1.3.4	Animals that have a complete, tube-like gut with two openings	A: Arthropoda B: Cnidaria
1.3.5	C-shaped cartilaginous rings	A: Oesophagus B: Pharynx
1.3.6	Organisms that cause ringworm, rusts and thrush	A : Porifera B : Fungi

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

1.4 The three organisms shown below all have a different mechanism by which they get oxygen from the surrounding environment. Study the diagrams and answer the questions that follow.

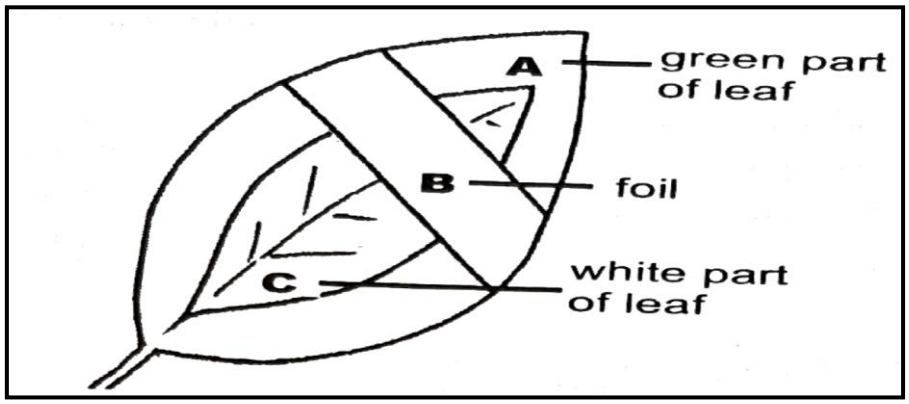


1.4.1 Name the respiratory organ of organism C. (1)

1.4.2 List THREE important factors that these respiratory organs in the above diagrams have in common for them to be an efficient gaseous exchange surface. (3)

1.4.3 Explain why the respiratory organ used by organism **B** would not be a suitable respiratory organ for organism **A.** (2)
(6)

1.5 Study the diagram of a leaf that was used during a photosynthesis experiment and answer the questions.



1.5.1 Which two factors were tested simultaneously? (2)

1.5.2 Why was the plant first put in a dark cupboard? (1)

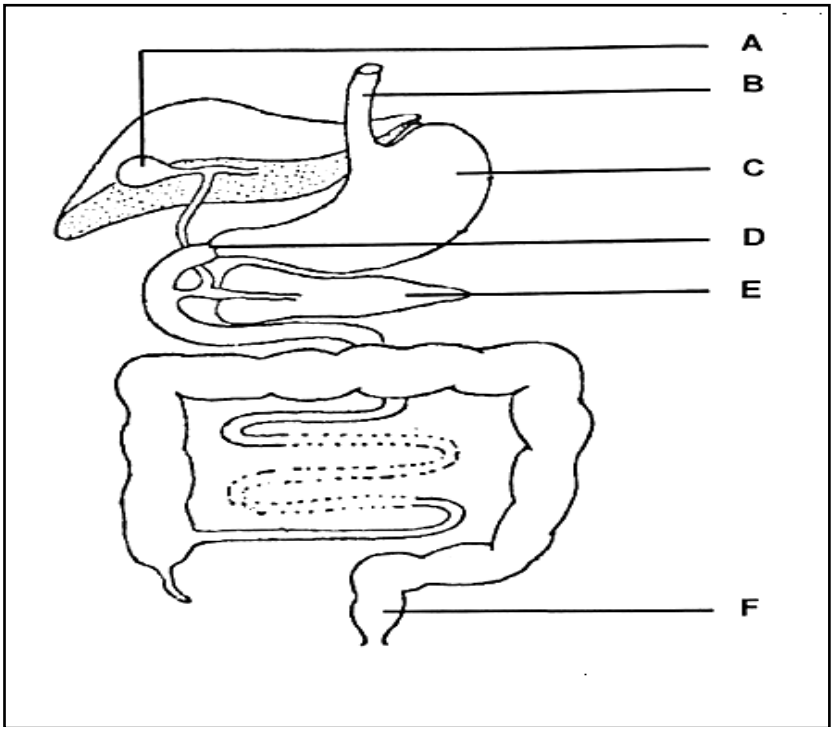
1.5.3 Draw and label a neat diagram that shows the result of this investigation. Show the colour changes after starch test for parts marked A, B and C. (3)
(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The diagram below shows parts of human digestive system. Study the diagram and answer the questions.



2.1.1 Identify parts labelled **B** and **E.** (2)

2.1.2 Write down the LETTER of the part that:

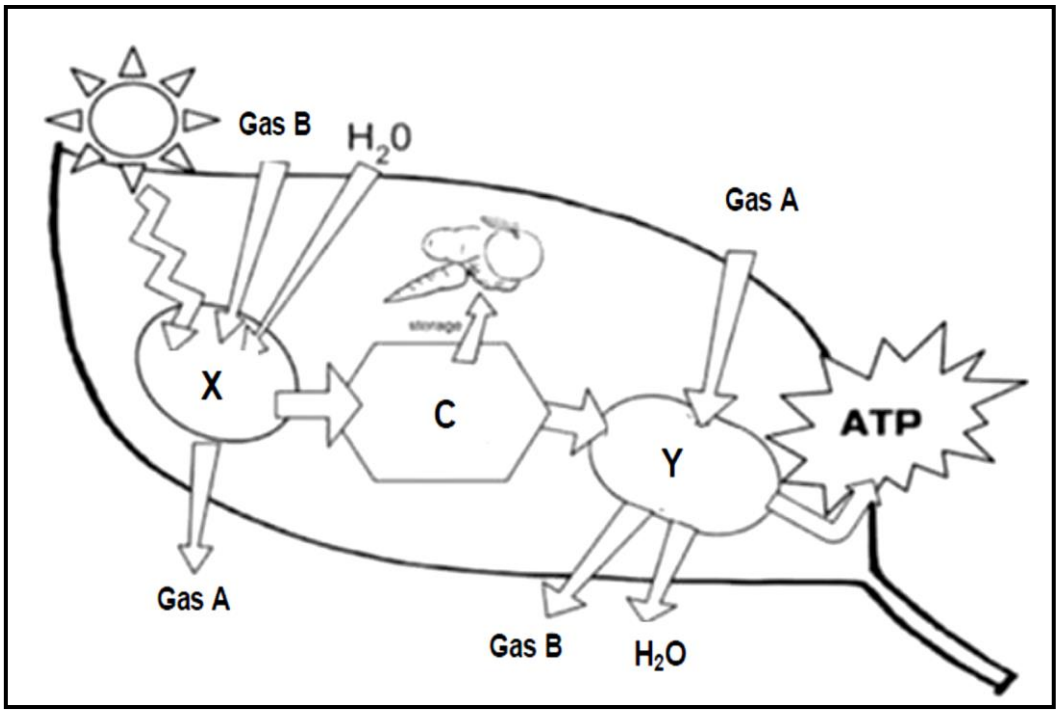
(a) regulates the entry of food in the small intestine (1)
(b) temporary stores undigested food remains (1)

2.1.3 State any TWO functions of the digestive juice released from part labelled **A**. (2)

2.1.4 Name the chronic health risk caused by the malfunctioning of part labelled **E** to produce low level of insulin. (1)

2.1.5 List THREE adaptations of the small intestine for the absorption of dissolved food. (3)
(10)

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



2.2.1 Identify the organelle labelled **X**. (1)

2.2.2 Name the metabolic process takes place in organelle **Y**. (1)

2.2.3 Tabulate TWO differences that occur between the metabolic processes in organelle **X** and **Y.** (5)

2.2.4 Identify the gas labelled **A** and **B** respectively. (2)

2.2.5 List TWO ways in which the process associated with organelle **X** is biologically important. (2)

2.2.6 Draw a labelled drawing of the organelle labelled **Y.** (4)
(15)

2.3 A learner investigated the effect of 'drying the skin' on the number of bacteria on people's hands after washing and drying. The same washing method was employed, but hands were dried either by using hot air from a hot air blower or by using paper towels. Swabs were used to take samples from the dried skin and bacteria were cultured from the swabs. The table below shows the number of bacteria that was cultured. Study the table and answer the questions that follow.

SAMPLES	**NUMBER OF BACTERIA ($x10^8$) PER SQUARE CENTIMETRE (CM^2) ON HAND SKIN FOLLOWING WASHING AND DRYING.**	
	Air-dried skin	Towel-dried skin
1	8,91	1,11
2	9,75	0,98
3	6,14	0,42
4	8,72	1,02

2.3.1 Name the:

(a) independent variable (1)

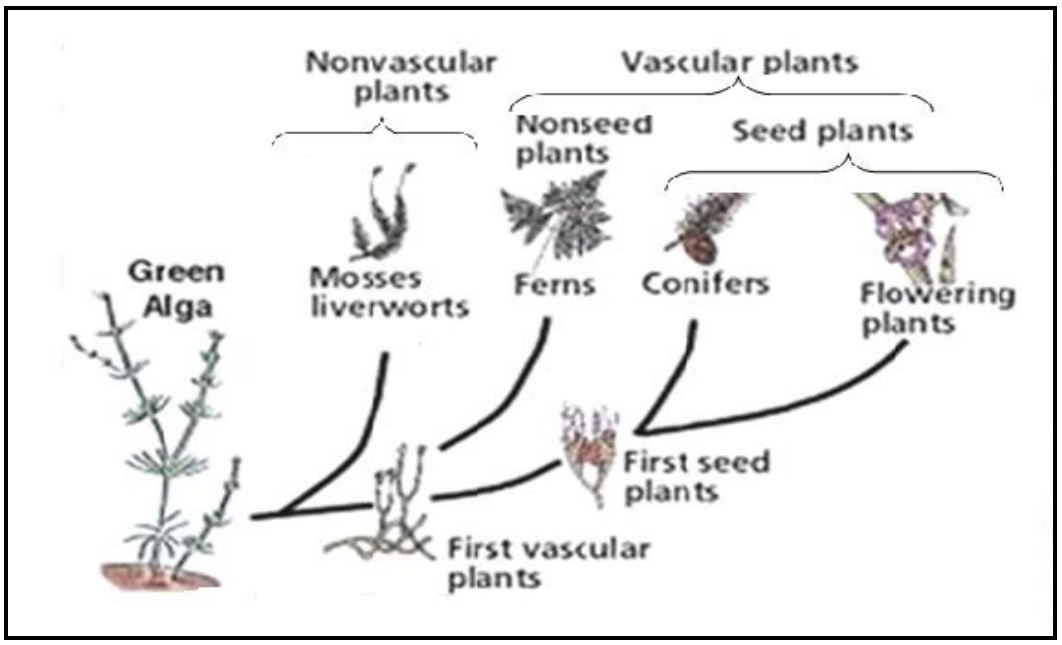
(b) dependent variable (1)

2.3.2 Suggest ONE factor that must be controlled in this investigation to make this a fair test. (1)

2.3.3 Draw a bar graph to show the number of bacteria on four samples of skin after they have been towel dried. (6)

(9)

2.4 A phylogenetic tree for the plants is shown below. Use the phylogenetic tree to answer the questions that follow:



2.4.1 What is a phylogenetic tree? (2)

2.4.2 Which plant is the common ancestor of the mosses, ferns, conifers and flowering plants? (1)

2.4.3 What does it mean if a plant is said to be vascular? (1)

2.4.4 Name TWO ways how conifers are adapted for wind-pollination. (2)

(6)

TOTAL QUESTION 2: 40

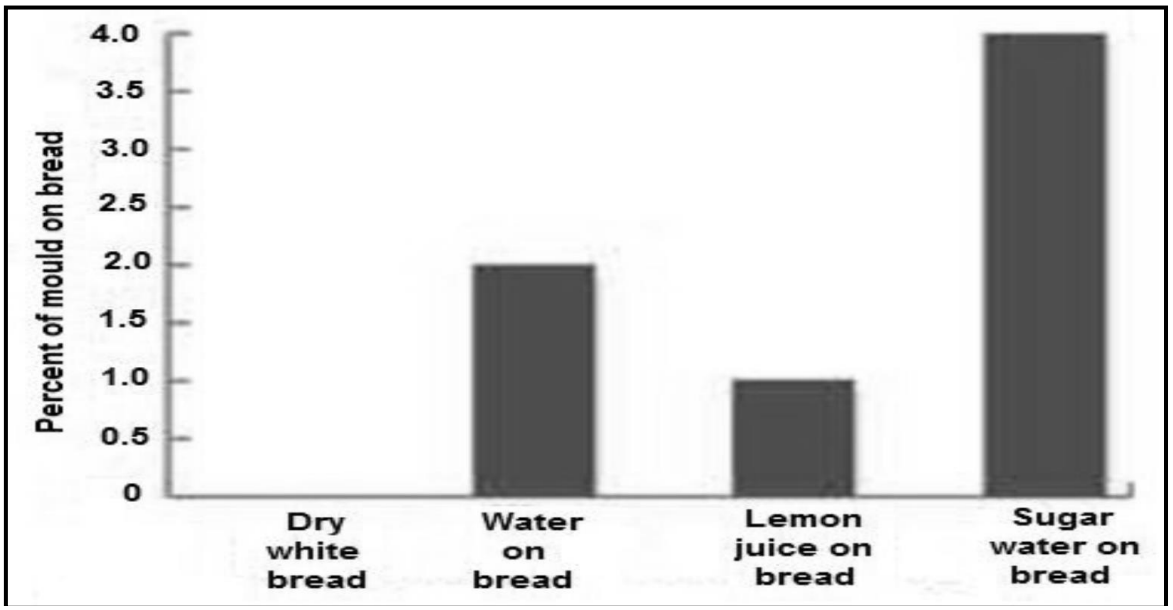
QUESTION 3

3.1 Group of learners carried out an experiment to find out what factors help mould to grow on bread

They took 4 slices of white bread and put different substances on each slice of bread as follows:

Slice 1 was left dry
Slice 2 was moistened with 20 mℓ of tap water
Slice 3 was sprinkled with 20 mℓ of lemon juice
Slice 4 was dampened with 20 mℓ sugar solution

Each slice of bread was put in a Ziploc bag and kept in a dark cupboard at a temperature of about 25 °C for two weeks. They observed the growth of mould on the four slices of bread and worked out the percentage area of the bread covered by mould. The results are shown in the graph below.



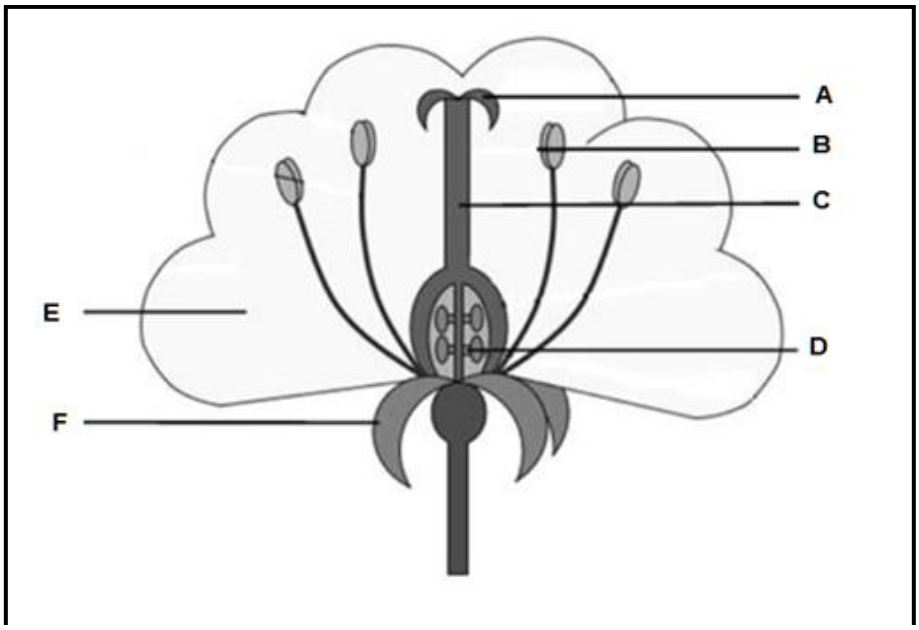
3.1.1 State a hypothesis for this investigation. (2)

3.1.2 Explain why mould did not grow well on the bread sprinkled with lemon juice. (2)

3.1.3 Why was dry bread included in the experiment? (2)

3.1.4 Identify and briefly describe the type of nutrition of *Rhizopus* (breadmould). (3)
(9)

3.2 Study the diagram of a flower of an Angiosperm and answer the questions that follow.



3.2.1 Write down the letter of the part where the female gametes would be produced. (1)

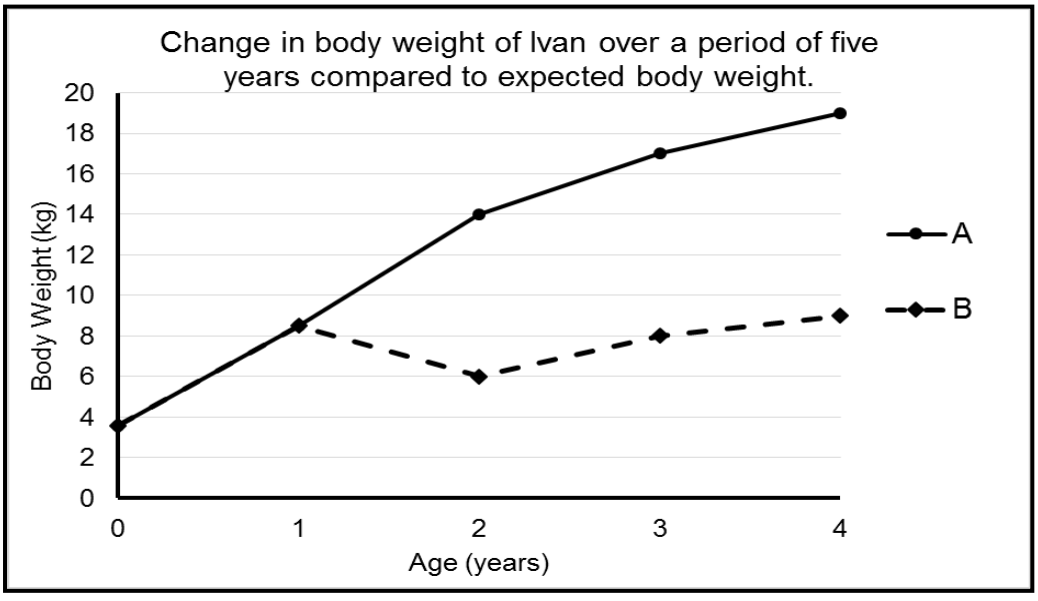
3.2.2 What type of pollination can be linked to this flower? (1)

3.2.3 In this flower, both male and female organs mature at the same time. Explain ONE feature that can prevent self-pollination. (2)

3.2.4 State ONE way in which the Angiosperm is better adapted to a terrestrial life than the Bryophytes. (1)

(5)

3.3 The graph below shows the changes in body weight of a boy in grade 10, over a period of four years. Curve B is the boy's actual body weight as a result of eating a diet of mainly white bread and porridge for all his meals. He has developed a swollen stomach and is often tired. Curve A shows what the body's weight should be.



3.3.1 Name the nutritional disease that Ivan is suffering from. (1)

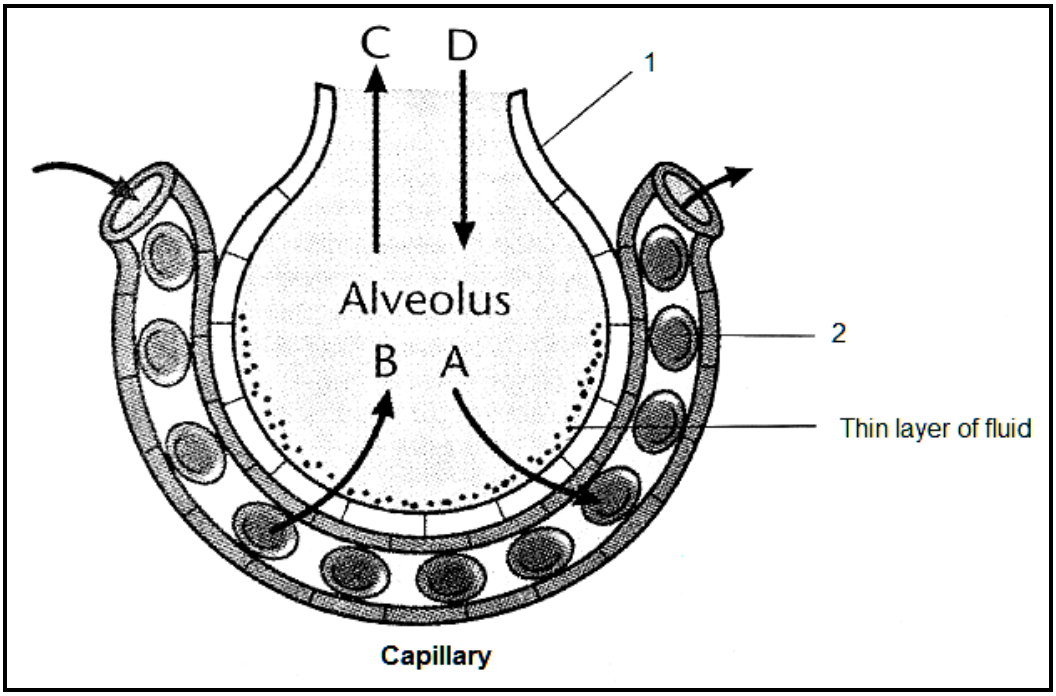
3.3.2 Explain why Ivan is suffering from this disease mentioned in question 3.3.1. (2)

3.3.3 What is the difference between what Ivan should weigh and his actual weight at four years of age? (3)

3.3.4 Describe how fats enter Ivan's blood from his digestive system. (2)

3.3.5 Name the finger like outgrowths found in Ivan's small intestine that are responsible for absorbing nutrients. (1)
(9)

3.4 Study the diagram below and answer the questions based on it.



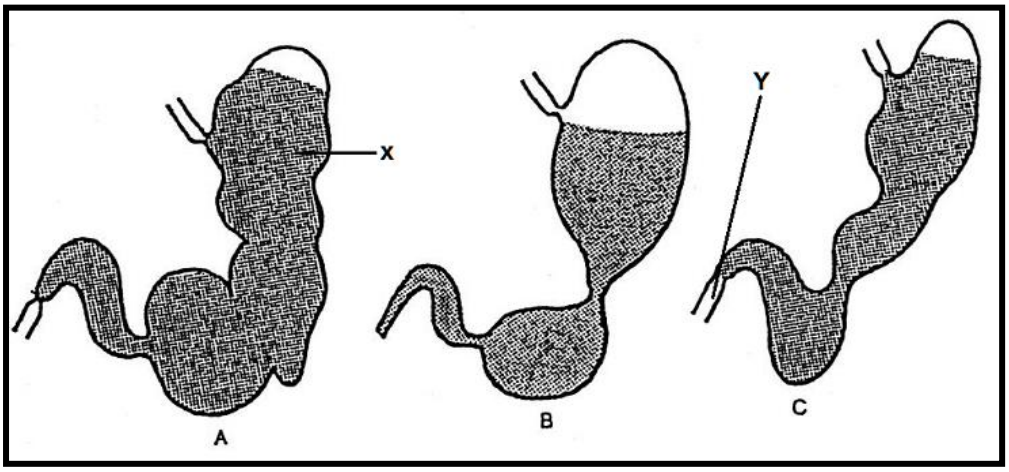
3.4.1 Identify the following:

(a) tissue forming the wall of the alveolus labelled **1** (1)
(b) the cell type labelled **2** (1)
(c) oxygen-carrying pigment that cell **2** contains (1)

3.4.2 Name the gases shown at A and B in the diagram. (2)

3.4.3 Explain THREE ways in which an **alveolus** is adapted to carry out its function. (6)
(11)

3.5 The pictures below show three frames taken at ten second intervals from a X-ray film of a patient who had been given a meal.



3.5.1 Identify the organ, labelled X, of which the X-rays were taken. (1)

3.5.2 Name …

(a) ONE enzyme secreted by organ X. (1)
(b) the substance that leaves this organ at Y (1)

3.5.3 What term is used to describe the pattern of muscular movements as seen in the series of pictures? (1)

3.5.4 Give TWO functions that are performed by the movements named in question 3.5.3 in this part of the alimentary canal. (2)
(6)

TOTAL QUESTION 3: 40

TOTAL SECTION B: 80

SECTION C
QUESTION 4

Breakfast is the most important meal of the day. It provides you with energy and it also helps to maintain your blood glucose level throughout the day. A person eats a bowl of maize meal porridge for breakfast. Explain the digestion and absorption of the porridge and how the human body regulates the blood glucose levels after the meal of porridge.

Content: (17)
Synthesis: (3)
(20)

NOTE: NO marks will be awarded for answers in the form of flow charts or diagrams.

TOTAL SECTION C: 20

GRAND TOTAL: 150