

INSTRUCTIONS AND INFORMATION

1. Answer all questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Present your answers according to the instructions of each question.
4. All drawings should be done in pencil and labelled in blue or black ink.
5. Draw diagrams or flow charts only if ask to do so.
6. The diagrams or flow charts are NOT drawn to scale.
7. Do NOT use graph paper.
8. You may use a non-programmable calculator, protractor and compass.
9. 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- D) next to the question number.

1.1.1 Carbohydrates contain...

- A. sometimes monosaccharides, always amino acids
- B. saccharides only
- C. amino-acids and disaccharides
- D. fatty acids and glycerol

1.1.2 The strengthening tissue with thickened cell walls in the corners only, is known as

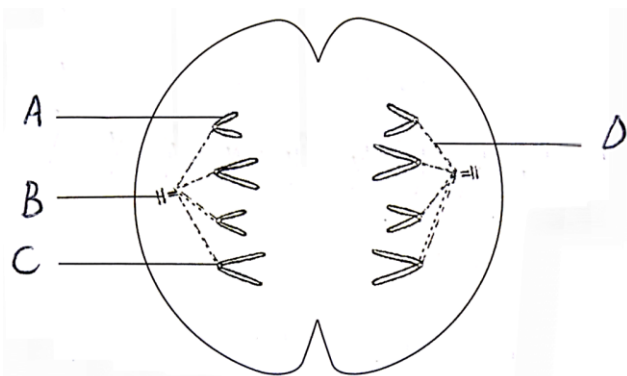
- A. collenchyma
- B. phloem
- C. chlorenchyma
- D. schlerenchyma

1.1.3 Which inorganic compound is most abundant in the bodies of animals and plants?

- A. Vitamins
- B. Water
- C. Proteins
- D. Carbohydrates

Question 1.1.4 and 1.1.5 are based on the diagram below

Study the diagram that represents a phase of mitosis



1.1.4 How many chromosomes will this cell have after mitosis has occurred?

- A. 2
- B. 4
- C. 3
- D. 8

1.1.5 Parts labelled A, C and D represents respectively...

- A. chromatid; centriole; spindle fibre
- B. chromatid; centromere; spindle fibre
- C. centromere; spindle fibre; chromatid
- D. chromatid; spindle fibre; centriole

1.1.6 Vitamins A and D prevent the following deficiency diseases...

- A. Beriberi and rickets
- B. night blindness and rickets
- C. scurvy and bleeding gums
- D. beriberi and scurvy

1.1.7 Specialised epidermal cells that allow gasses to enter and exit the leaf, is known as...

- A. companion cells
- B. meristematic cells
- C. guard cells
- D. parenchyma cells

1.1.8 The red pigment in blood that carries oxygen is...

- A. found in leucocytes
- B. found in the platelets
- C. not found in erythrocytes
- D. known as haemoglobin

1.1.9 To magnify an object on the microscope we multiply the...

- A. magnifying power of the eyepiece with the magnifying power of the objective lens
- B. magnifying power of the eyepiece with the size of the hole of the diaphragm
- C. the magnifying power of the objective lens with the size of the hole of the diaphragm
- D. the size of the hole of the diaphragm with 10

9x2=(18)

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 The light trapping pigment found in the leaves

1.2.2 The deficiency disease that is characterise by a growth on the neck

1.2.3 The disease that develop as a result of uncontrolled cell division.

1.2.4 The plant tissue found just below the epidermis in roots

1.2.5 The substance that an enzyme react on

1.2.6 A specimen that is about to be viewed under a microscope

1.2.7 A pore in the epidermis of the leaf surrounded by guard cells

1.2.8 The functional and structural unit of the nervous system

1.2.9 Structure in blood that is responsible for blood clotting

1.2.10 Process that cause the shape and the function of an enzyme to change

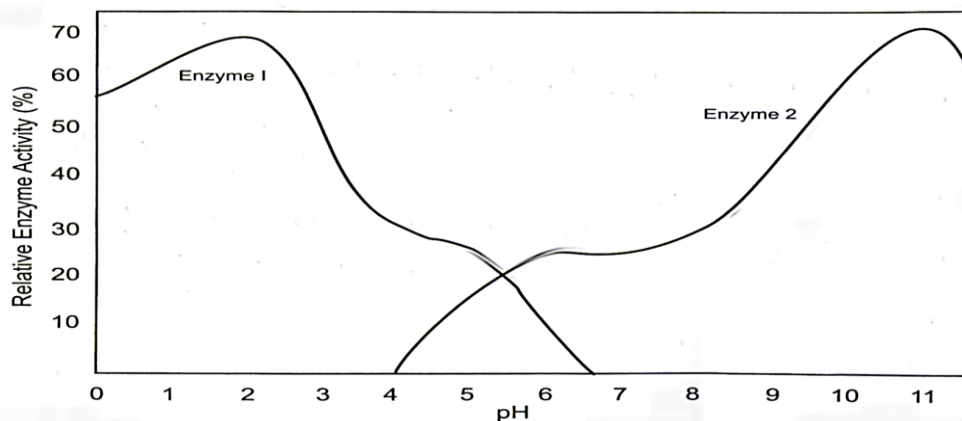
(10)

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 CLOUMN II. Write A only, B only, Both A and B or NONE next to the question number.

Column I	Column II
1.3.1 The stage in the cell cycle when the chromosomes line up on the equator	A. Interphase B. Metaphase
1.3.2 Responsible for protein synthesis	A. Lysosome B. Ribosome
1.3.3 Transport water and mineral salts from roots to all parts of the plant	A. phloem B. xylem
1.3.4 The way(s) of how plants can get rid of excess water	A. Guttation B. Transpiration
1.3.5 The plant cells responsible for photosynthesis in leaves	A. Pallaside cells B. Spongy cells
1.3.6 The function of blood platelets is	A. Allows blood clotting B. Transport carbon dioxide
1.3.7 Plant cell /s without a nucleus	A. Parenchyma B. Companion cell
1.3.8 Annual rings in tree trunks tell us...	A. how old the tree is in years B. how tall the tree can grow
1.3.9 Examples of nucleic acids are...	A. DNA B. RNA

9x2=(18)

1.4 Study the graph showing activity of two enzymes in the human digestive system. Use the key to answer the question set. Note that your answer will be either A, B or C



KEY:

A= Statement based on data

B = Statement proved wrong by data

C = Statement is unrelated to data

1.4.1 Enzyme activity increases with an increase in pH

1.4.2 Enzyme 1 and 2 function in the same region of the digestive tract

1.4.3 Different enzymes operate at an optimum level at different pH ranges

1.4.4 Enzyme activity is influenced by temperature

(4)

TOTAL SECTION A: {50}

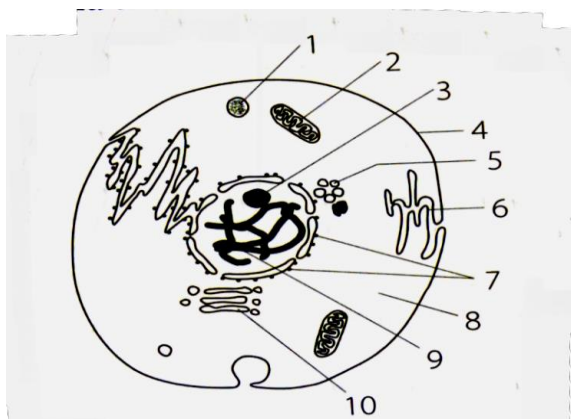
SECTION B
QUESTION 2

2.1 Study the table below, which shows the results of certain tests on five different food types A to E.

FOOD TYPE	NAME OF TEST AND COLOUR CHANGE		
	Benedict`s / Fehling`s test	Iodine test	Biurett test
A	Orange	Yellow	Pale blue
B	Blue	Black	Pale blue
C	Orange	Yellow	Purple
D	Blue	Black	Purple
E	Orange	Black	Purple

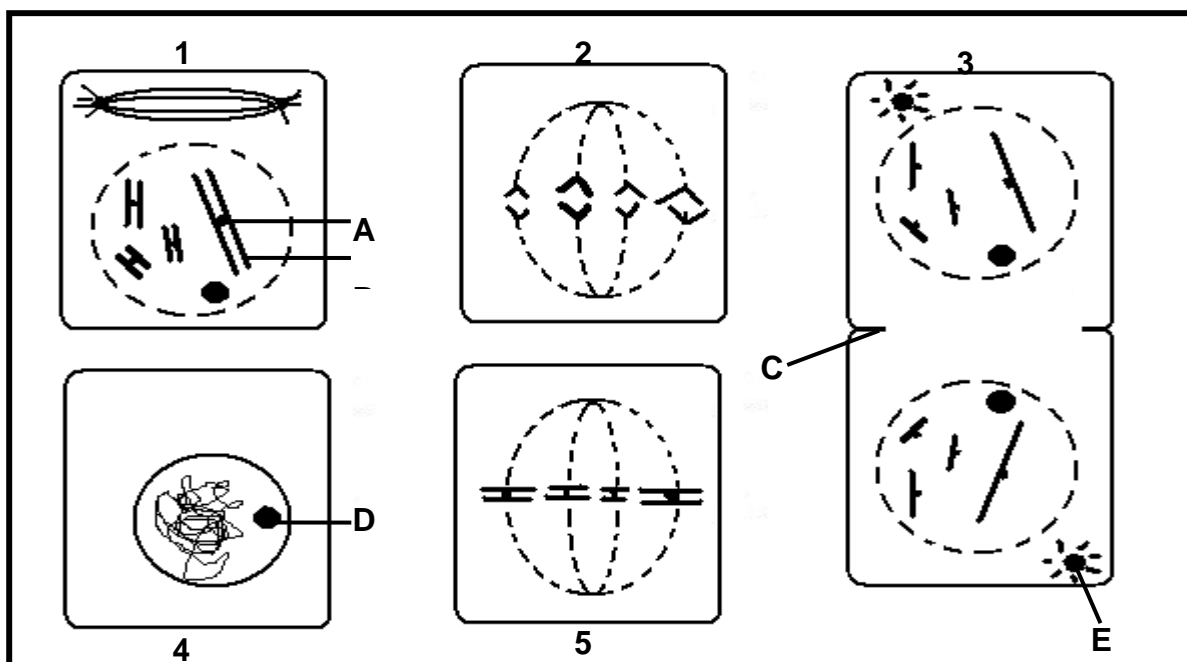
- 2.1.1 Which food type only contains:
- i. Starch (1)
 - ii. Glucose (1)
- 2.1.2 Which food type contains both starch and glucose? (1)
- 2.1.3 Which food type contain starch, glucose and protein? (1)
- 2.1.4 Rice contains starch and proteins, but no glucose. Which food type is probably rice? (1)
(5)

2.2 Study the diagrams below and answer the questions that follow



- 2.2.1 Is this a plant or an animal cell? (1)
- 2.2.2 Give two visible reasons for your answer. (2)
- 2.2.3 Name the parts labelled 6 and 10. (2)
- 2.2.4 The function of organelle 2 is to provide energy to the cell. Draw a labelled and an enlarge diagram of diagram 2. (4)
(9)

2.3 Study the diagrams below and answer the questions that follow.



- 2.3.1 Provide labels for structures A, B, D and E. (4)
- 2.3.2 BY making use of NUMBERS ONLY, arrange the phases into the correct sequence. (4)
- 2.3.3 Write down the number of chromosomes in a daughter cell at the end of the process shown above. (1)
- 2.3.4 Which number represents metaphase? (1)
- 2.3.5 Give a reason for your answer in question 2.2.4. (1)

2.4 The table below shows the nutritional value of a certain brand of breakfast cereal. Study the information before answering the questions. (11)

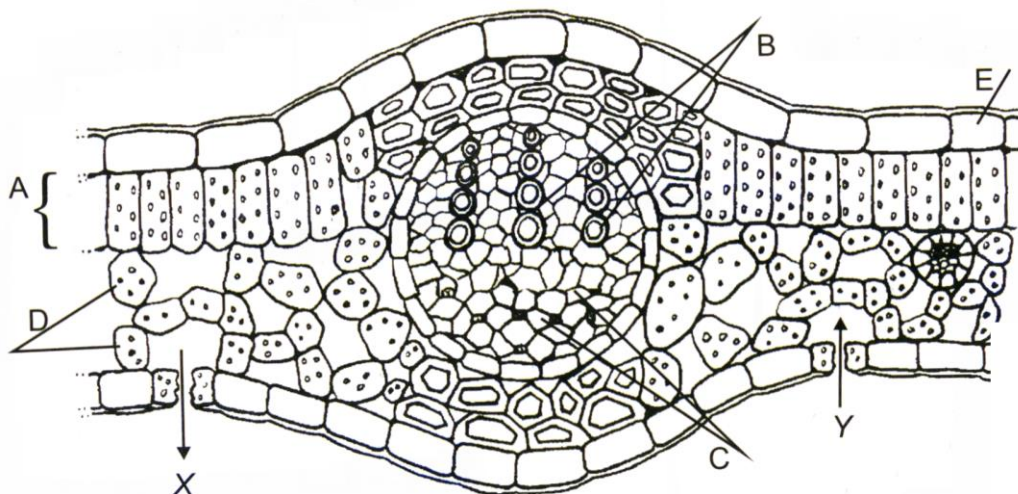
NUTRITIONAL COMPOSITION OF THE CEREAL

INGREDIENTS	NUTRITIONAL INFORMATION (Values per 100g)	
	Whole role oats, roasted wheat flakes, cane syrup, brown sugar, vegetable oil, sun-dried raisins	Energy
Protein		12,5 g
Carbohydrates		50 g
Fats		12,5 g
Fibre		25 g
Cholesterol		0 mg

- 2.4.1 Explain one advantage of this cereal having no cholesterol. (1)
- 2.4.2 Calculate the percentage fibre per 100g of the cereal. (2)
- 2.4.3 Draw a bar graph to illustrate the relative proportions of protein, carbohydrates, fats and fibre of this 100 g of cereal. (6)

(9)

2.5 The diagram below shows part of a section through a leaf.

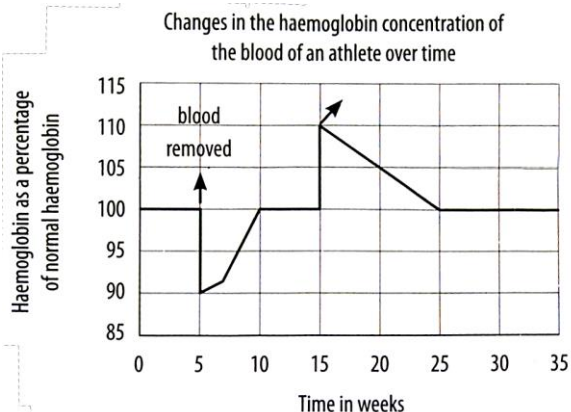


- 2.5.1 Name the part labelled E. (1)
- 2.5.2 Explain why part E is transparent. (2)
- 2.5.3 Name the gasses that is represented by X and Y in the diagram. (2)
- 2.5.4 Name the function of parts A. (1)

QUESTION 2 [40]

QUESTION 3

3.1 In the Olympic Games held in Athens in 2004, a long distance athlete had 500 ml of his own blood removed, stored and returned to his body a few days before he completed the marathon. This practice, called blood doping, is banned by athletics officials. Study the graph below showing the haemoglobin content of the blood in the athlete`s body over a period of 35 weeks and answer the questions that follow.



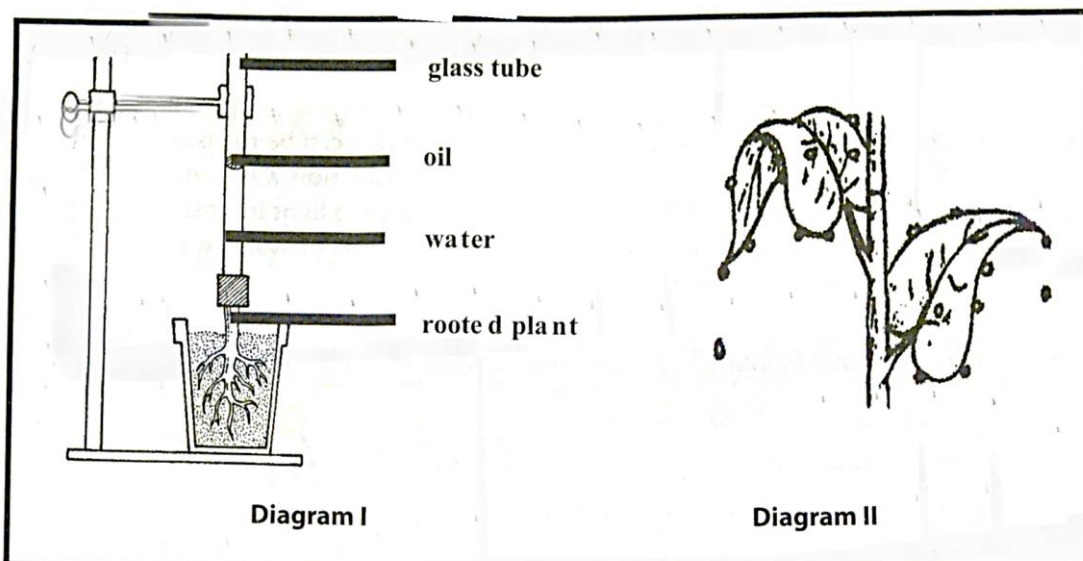
- 3.1.1 In which weeks was the blood removed from the athlete`s body? (1)
- 3.1.2 How many weeks did it take for the athlete`s haemoglobin level to go back to normal after the blood has been removed? (2)
- 3.1.3 Explain what advantage this athlete would have had, compared to an athlete who did not undergo blood doping. (3)
- 3.1.4 Why do you think that officials would find it difficult to detect this form of blood doping? (2)
- 3.1.5 Why will you not consider this act of blood doping as acceptable? (2)

3.2 Read the following passage regarding cancer and answer the questions that follow:

Cancer is a disease in which the body's cells display uncontrolled division. Cancer cells may invade nearby tissue and may spread through the bloodstream or lymphatic system to other parts of the body. Nearly all cancers are caused by abnormalities in the genetic material of transformed cells. These abnormalities may be caused by carcinogens. Diagnosis usually requires the histologic examination of a tissue biopsy specimen by a pathologist. Most cancers can be treated and some can be cured, depending on the specific type, location and stage of the cancer.

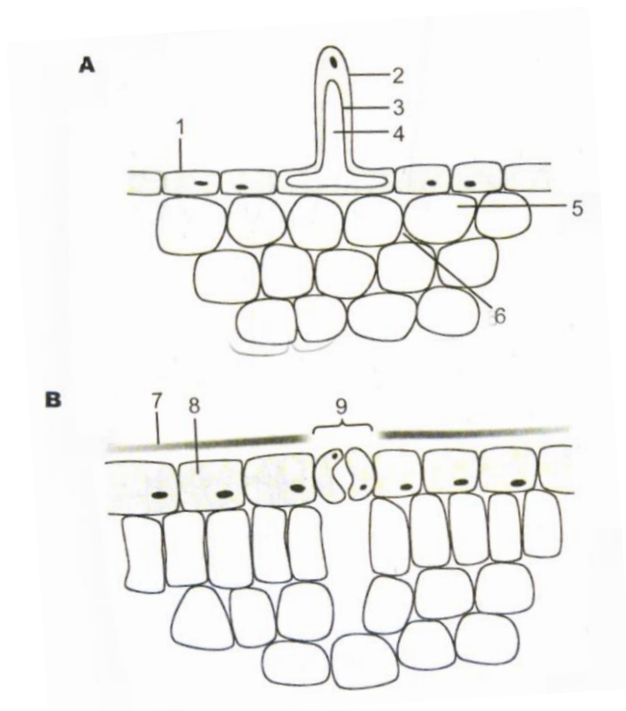
- 3.2.1 Define the term cancer. (2)
- 3.2.2 Name two examples of carcinogens. (2)
- 3.2.3 Name two ways in which cancer can be treated. (2)
- 3.2.4 State whether each of the following statements about cancer is true or false.
 - i. Not all tumours are harmful. (1)
 - ii. Most cancers are genetic. (1)(8)

3.3 Study the diagrams below and answer the questions that follow



- 3.3.1 Name the process illustrated in:
 - i. Diagram I (1)
 - ii. Diagram II (1)
 - 3.3.2 What is the purpose of the oil in diagram I? (2)
 - 3.3.3 List FOUR environmental factors, which will influence the rate of water loss by leaves. (4)
- (8)

3.4 Study the diagrams and answer the questions that follow.



3.4.1 Diagram A and B represent cross sections of a leaf and a root. Which plant organ is represented by:

- i. A (1)
- ii. B (1)

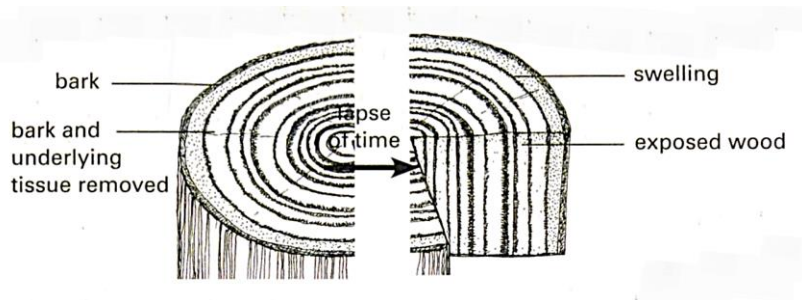
3.4.2 Give 2 visible reason for your answer in question 3.4.1 I and ii. (2)

3.4.3 Identify the labels 1, 4 and 9. (3)

3.4.4 Name the gasses that:

- i. Enter and (1)
 - ii. move out of part 9. (1)
- (9)

3.5 Ring-barking is a practice commonly used to destroy alien trees. Once a tree has been ring-barked, its roots die. As a result the tree also dies. The diagram below shows a tree immediately after ring-barking and then a few weeks after it has been ring-barked. Study the diagram and answer the questions that follow.



3.5.1 Which vascular tissue is removed when the bark is cut off from the tree? (1)

3.5.2 Why do trees normally die once they have been ring-barked? (1)

3.5.3 Draw a simple diagram of the vascular bundle of a dicotyledonous stem.

(3)
(5)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

4.1 Water is a compound that is involve in a number of important processes in plants. Write an essay in which you describe how water is absorbed from the soil, the three ways how water moves from the root hair to the root xylem and describe how water moves up in the stems of plants.

Content: (17)
Synthesis: (3)

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

Total Section C: 20

GRAND TOTAL: /150/