WINGEN HEIGHTS SECONDARY SCHOOL

GRADE 10

LIFE SCIENCES PAPER 1

NOVEMBER EXAMINATION 2019

Examiner: Mr K. Naicker

Moderator: Mrs A. Govindasamy

Duration: 2,5 Hours

Total Marks: 150

NB: This paper consists of 17 pages.

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 answer 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 must be drawn in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. You may use a non-programmable calculator, protractor and a compass where necessary.
10. 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 – 1.1.10) in the answer book, for example : 1.1.11 D.

1.1.1 The organelles that synthesise proteins are called ...

A) ribosomes.

B) mitochondria.

C) chloroplasts.

D) nucleoli.

1.1.2 The part of the plant cell responsible for providing support is ...

A) the cell wall only.

B) the vacuole only.

C) the cell wall and nucleus.

D) the cell wall and vacuole.

1.1.3 Which of the following plant tissues does NOT play an important role in supporting a plant?

A) collenchyma

B) schlerenchyma

C) parenchyma

D) xylem

1.1.4 The axial skeleton is made up of the following regions:

A) Skull, vertebral column and hip bones

B) Skull, vertebral column, ribs and sternum

C) Skull, pectoral girdle, ribs and sternum

D) Skull, pelvic girdle, ribs and sternum

1.1.5 The building blocks of proteins is ...

A) disaccharides.

B) monosaccharides.

C) amino acids.

D) glycerol.

1.1.6 The mitochondria is the site of ...

A) photosynthesis.

B) cellular respiration.

C) cellular division.

D) cytokinesis.

1.1.7 The single membrane surrounding a vacuole:

A) Lysosome

B) Plastid

C) Tonoplast

D) Dictyosome

1.1.8 Which of the following does NOT form part of a neuron or nerve cell?

A) dendrite

B) axon

C) myelin sheath

D) cilia

1.1.9 The ability of water to rise up narrow tubes spontaneously is called...

A) Transpiration

B) Capillarity

C) Guttation

D) Evaporation

1.1.10 When tomatoes ripen, the following occurs ...

A) Chromoplast change to chloroplast.

B) Chloroplasts change to chromoplast.

C) Leucoplasts change to chloroplast.

D) Chromoplasts change to leucoplasts.

(10 × 2) = 20

1.2 Provide the correct biological term for each statement given below. Write down the question number and the answer only.

1.2.1 The light trapping pigment located in leaves.

1.2.2 Movement of gas molecules from a region of high concentration to a region of low concentration.

1.2.3 The ground substance that is found between the cells that make up tissues.

1.2.4 A pore in the epidermis of the leaf that is surrounded by two guard cells.

1.2.5 The chemical indicator used to test for the presence of starch.

1.2.6 waxy layer that prevents evaporation of water.

1.2.7 Found mainly within the chromosomes and are the carriers of genetic information.

1.2.8 Neuron that carries nerve impulses from CNS towards effector/muscle.

1.2.9 Part of the skull which contains and protects the brain.

1.2.10 Growing of a plant or part of an animal from a few cells (tissue).

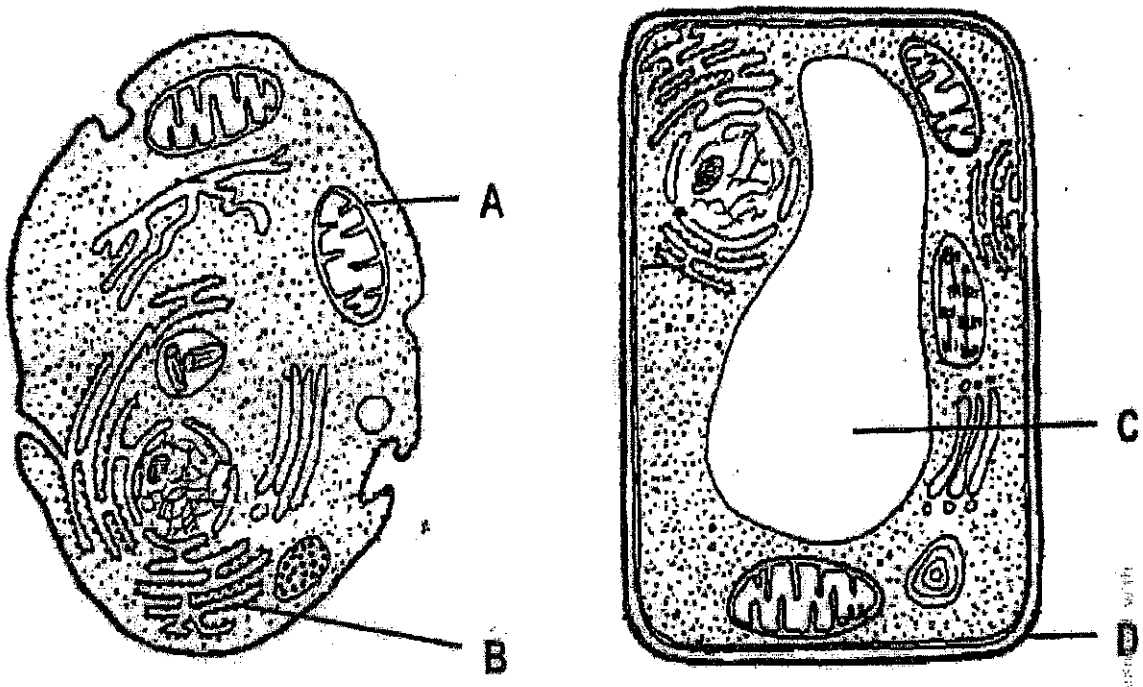
(10x1) = 10

1.3 Indicate whether each of the statements below applies to A ONLY, B ONLY, BOTH A AND B, or NONE. Write A ONLY, B ONLY, BOTH A AND B, or NONE next to the question number.

Column 1	Column 2
1.3.1. The first vertebra of the human vertebral column	A. Atlas B. Axis
1.3.2. Transports organic food in plants	A. phloem B. sieve tubes
1.3.3. This organelle is known as the 'Power house' of the cell	A. Vacuole B. Mitochondria
1.3.4. Muscles controlled by the will	A. Smooth muscle B. Cardiac
1.3.5. RBC (Red blood cells) are responsible for	A. Transporting CO_2 B. Transporting O_2

(5x2)= 10

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



Cell X Cell Y

1.4.1 Which cell, (X or Y) represents an animal cell? (1)

1.4.2 Give TWO visible reasons for your answer in 1.4.1. (2)

1.4.3 Provide labels for parts B, C and D. (3)

1.4.4 Structure C plays an important role in cell Y. Provide THREE functions of this structure. (3)

1.4.5 Name the organic substance that part D in cell Y mainly consists of. (1)

(10)

TOTAL QUESTION ONE : 50

TOTAL SECTION A : 50

SECTION B

QUESTION 2

2.1 Read the passage below and answer the questions which follow.

Sutherlandia frutescens

Common names: Cancer bush (English); umnwele (isiXhosa and isiZulu);; kankerbos (Afrikaans) This plant is one of the most talked about in the ethnobotanical world because it has a strong reputation as a cure for cancer and as an immune booster in the treatment of HIV/Aids. Research on its properties is ongoing. It has long been known, used and respected as a medicinal plant in southern Africa. The original inhabitants of the Cape, the Khoi San and Nama people, used it mainly for the washing of wounds and took it internally to bring down fevers. *Sutherlandia* continues to be used to this day by traditional healers as a remedy for a wide range of ailments. These include colds and flu, asthma, TB, bronchitis, liver problems, bladder, uterus and 'women's' complaints, diarrhoea, stomach ailments, heartburn, backache, diabetes and inflammation. It is also used in the treatment of mental and emotional stress. There is as yet no scientific support for the numerous claims that this plant can cure cancer, but there is preliminary clinical evidence that it has a direct anti--cancer effect. *Sutherlandia's* real benefits are as a tonic that will assist the body to cope with the illness. Cancer, TB and Aids patients lose weight and tend to waste away. *Sutherlandia* dramatically improves the appetite and wasted patients start to gain weight. It is also known to improve energy levels and gives an enhanced sense of well--being. It is hoped that treatment with *Sutherlandia* will delay the progression of HIV into Aids.

Adapted from: www.plantzafrica.com

2.1.1 Give the isiXhosa and isiZulu common name for *Sutherlandia frutescens.* (1)

2.1.2 Why is *Sutherlandia frutescens* known as a medicinal plant? (2)

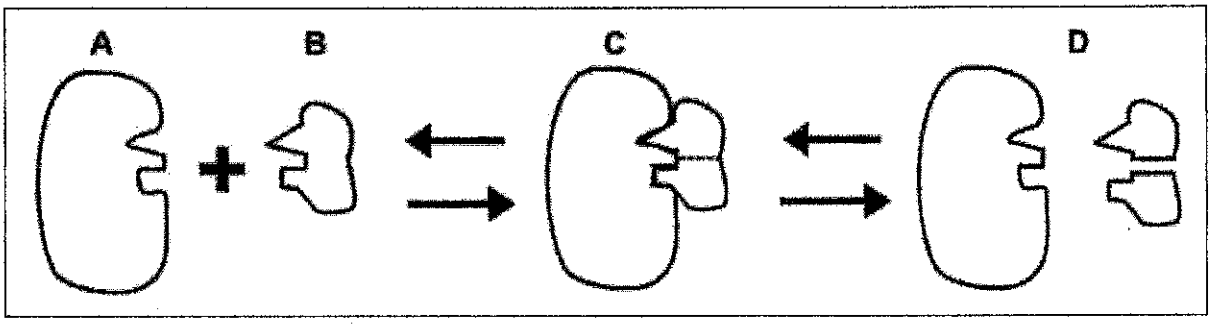
2.1.3 What did the Khoi San and Nama people use *Sutherlandia* for? (2)

2.1.4 Name TWO respiratory disorders that traditional healers treat by using *Sutherlandia.* (2)

2.1.5 Why is *Sutherlandia* beneficial to patients suffering from cancer, TB or Aids? (2)

(9)

2.2 The diagram below shows the action of an enzyme.



2.2.1 What is an enzyme? (1)

2.2.2 Provide labels A to D. (4)

2.2.3 List TWO characteristics of enzymes. (2)

2.2.4 Enzymes that break down fats and proteins are often added to washing powders. Give THREE reasons why the addition of enzymes makes the washing powder more effective. (3)

2.2.5 Explain what will happen if enzymes are subjected to high temperatures (Greater than its optimum temperature). (3)

(13)

2.3 Organic compounds far out number inorganic compounds. Organic compounds tend to be far more complex in structure than inorganic compounds. Life as we know it is based on organic compounds.

Below are characteristics related to organic compounds:

A. Contains nitrogen
B. Contains Hydrogen, Oxygen and carbon only
C. Energy source
D. Ratio of H:O is 2:1
E. Denatured by excessive heat.

Write down the letter(s) of the above list that corresponds to:

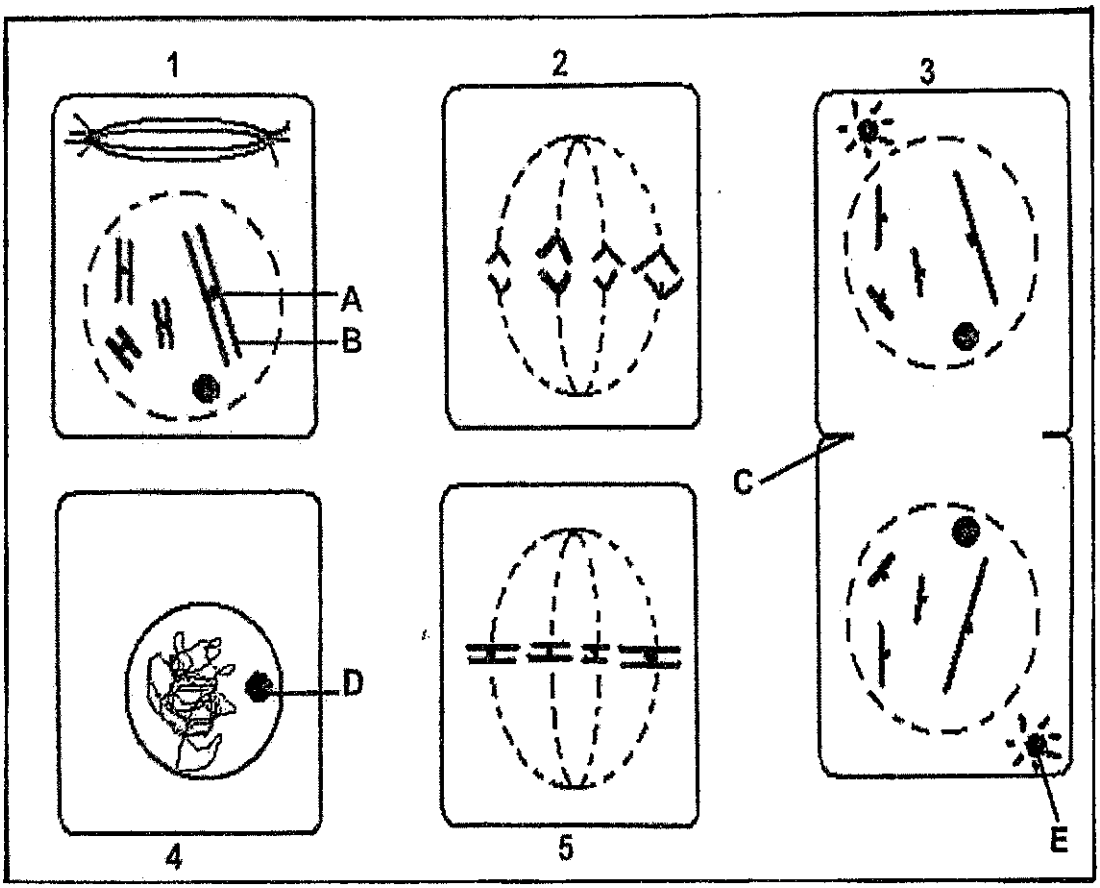
2.3.1 Any TWO characteristics related to Lipids. (2)

2.3.2 Any TWO characteristics related to Carbohydrates. (2)

2.3.3 Any TWO characteristics related to proteins. (2)

(6)

2.4 Study the diagrams below which represent different phases of mitosis.



2.4.1 Provide labels for parts **A, B, D** and **E**. (4)

2.4.2 By making use of the NUMBERS ONLY arrange the phases into the correct sequence. (2)

2.4.3 Tabulate ONE difference between plant and animal cells with regard to the process taking place at C. (2)

2.4.4 Refer to the phase numbered 5 (Metaphase). Discuss what happens in this phase. (2)

2.4.5 State TWO reasons why mitosis is a biologically important process. (2)

(12)

TOTAL QUESTION TWO: 40

QUESTION 3

3.1 Potatoes were treated differently and after that the Vitamin C content was measured. The ways in which the potatoes were treated and the results are shown in the table below. Study the table below and answer the questions that follow.

TREATMENT OF POTATOES.	VITAMIN C IN MILLIGRAMS PER 100 GRAMS.
Stored, uncooked	10
Fresh, uncooked	30
Fresh, boiled	20
Fresh, fried	10
Fresh, baked	5

3.1.1 Draw a bar graph to illustrate the information in the above table. (6)

3.1.2 Suggest how vitamin C could have been lost in the fresh, boiled potatoes. (1)

3.1.3 According to the information on the graph, which method of cooking potatoes conserves the most Vitamin C? (1)

3.1.3 State ONE function of vitamin C in the body. (1)

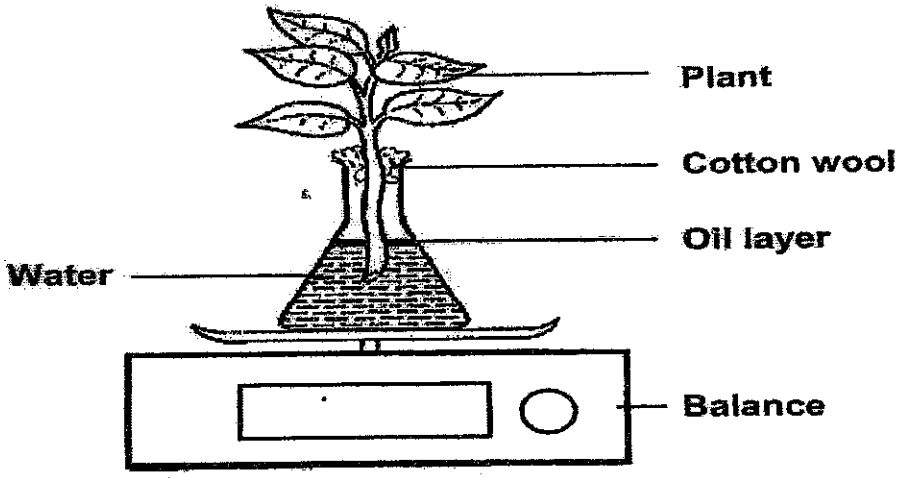
(9)

3.2 An investigation was carried out to study the effect of light intensity on the opening and closing of the stomata.

1. Apparatus X (shown below) was used to measure the rate of water loss from the leaves at several light intensities.

2. At each light intensity, the apparatus was left for 15 minutes before starting measurements.

3. The water loss was recorded in the dark and at four different light intensities.



Apparatus X

The results of this investigation are shown in the table below.

LIGHT INTENSITY (KILOLUX)	LOSS OF WATER (g/ hour)
0	1
10	15
20	20
30	22
40	20

3.2.1 State a hypothesis for this investigation. (2)

3.2.2 State the dependent variable in the above investigation. (1)

3.2.3 What evidence supports the statement that the stomata are fully open at a light intensity of 30 kilolux. (2)

3.2.4 What is the purpose of the oil layer over the water surface in the flask? (2)

3.2.5 Why is the apparatus left for 15 minutes at each new light intensity before starting the measurements? (2)

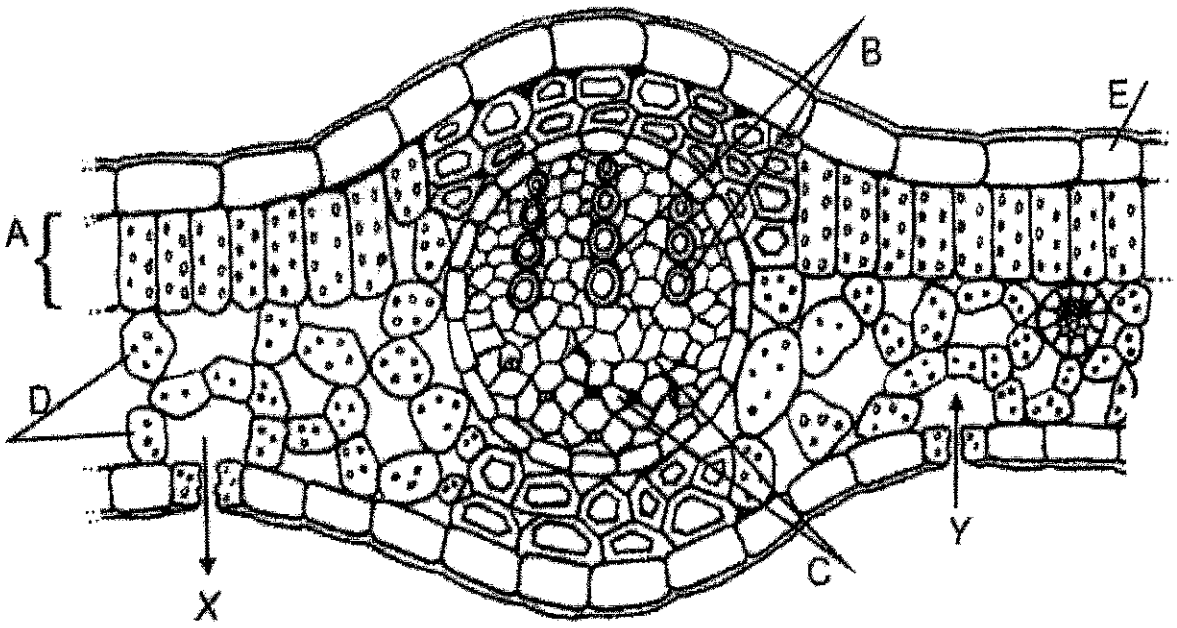
3.2.6 Predict what would be the effect on the results if the investigation was carried out at a lower temperature. (1)

3.2.7 Account for your prediction in QUESTION 3.2.6. (1)

3.2.8. Describe ONE way in which the reliability of the results obtained at each light intensity could have been increased. (1)

(12)

3.3. Study the diagram below showing part of section through a leaf



3.3.1 Name the part labelled E. (1)

3.3.2 Explain why part E is transparent. (1)

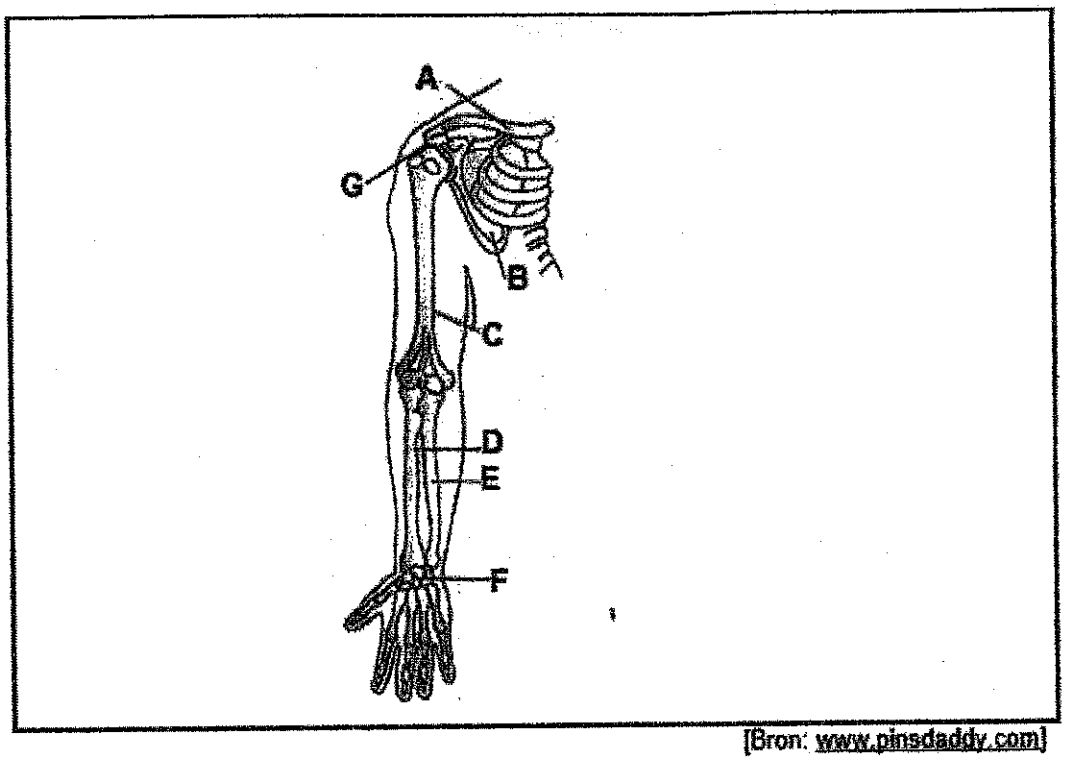
3.3.3 Name the gases that is represented by X and Y in the diagram. (2)

3.3.4 State the function of part A. (2)

3.3.5 In roots, there is a presence of root hairs which increases the surface area for absorption of water from the soil. Draw and label a root hair. (6)

(12)

3.4 Refer to the image below and answer the set questions.



[Bron: www.pinsdaddy.com]

3.4.1 List TWO functions of the skeleton. (2)

3.4.2 Provide labels for A, D and E. (3)

3.4.3 Name the ONE disease that affect the skeleton. (1)

3.4.4 Explain what would happen if the muscles attached to the back of the humerus cannot function . (1)

(7)

TOTAL QUESTION THREE: 40

TOTAL SECTION B : 80

SECTION C

QUESTION 4

4.1 Stem cell research has made a significant contribution to the medical field. Evaluate this statement by describing what are stems cells, where they are harvested, their uses and the ethical issues associated with them.

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

Content: (17)

Synthesis: (3)

TOTAL SECTION C: 20

GRAND TOTAL: 150