



Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sportontwikkeling
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NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 11

**LIFE SCIENCES
JUNE EXAMINATION
2019**

MARKS: 150

TIME: 2.5 hours

This question paper consists of 15 pages.



INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Write ALL the answers in the 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 labeled in blue or black ink.
7. Only draw diagrams or flow charts when asked to do so.
8. The diagrams in this question paper are NOT all drawn to scale.
9. Do NOT use graph paper.
10. Non-programmable calculators, protractors and compasses may be used.
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 the ANSWER BOOK, for example 1.1.20 C

1.1.1 Disease-causing agents are called ...

- A. antibiotics
- B. Vaccines
- C. Antibodies
- D. pathogens

1.1.2 Which of the following is a disadvantage of the unicellular state of protists?

- A. They do not require specialised structures
- B. They reproduce rapidly
- C. They are small and inconspicuous
- D. One cell has to perform all the metabolic

1.1.3 The structure that produces spores in the Rhizopus is the....

- A Sporangium
- B Archegonium
- C Sporangiochore
- D Columella

1.1.4 A child is taken to the hospital and diagnosed with a form of malnutrition. Upon further investigation, doctors learnt that the child used only maize meal as food. From what type of malnutrition is this child most likely to suffer?

- A Anorexia
- B Kwashiorkor
- C Marasmus
- D Bulimia

1.1.5 *E.coli* bacteria living in the colon of the human digestive system is an example of

- A Parasitism.
- B Mutualism.
- C Competition.
- D Commensalism.



1.1.6 Which characteristic is shared by *Cnidarians* and *Platyhelminthes*?

- A Dorsiventrally flattened body
- B A digestive system with a single opening
- C Radial symmetry
- D A distinct head

1.1.7 Participants in the Comrades Marathon usually follow a high carbohydrate diet prior to race. This is known as “carbo-loading”. In what form is this reserve energy stored?

- A Glycerol
- B Fat under skin
- C Glycogen
- D Fatty acids

1.1.8 How does a vaccine work?

- A It prevents the disease-causing agent from entering the body.
- B It attacks the disease- causing agent as soon as it enters the body.
- C It triggers the immune system to produce antibodies to fight the disease – causing agent.
- D it allows the blood to filter out the disease causing agent.

1.1.9 The zygote of the moss plant ...

- A Results from the fusion of two spores
- B develops into sporophyte
- C develops into portonema
- D is the part of the gametophyte generation

1.1.10 If all the green plants in the world were destroyed, the atmospheric gas that would increase would be:

- A Oxygen
- B Nitrogen
- C Hydrogen
- D Carbon dioxide)

(10X2) **(20)**



- 1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1–1.2.7) in the ANSWER BOOK.

- 1.2.1 An infectious particle capable of transmitting diseases.
- 1.2.2 The type of energy absorbed by chlorophyll.
- 1.2.3 Type of symmetry in which an animal can be cut in any vertical plane through its central axis to give two mirror images
- 1.2.4 Shedding of the exoskeleton in arthropods to allow growth
- 1.2.5 A structure of seeds which prevents desiccation
- 1.2.6 A form of cell division which only occurs during sexual reproduction.
- 1.2.7 Ball of food which is swallowed.

(7 X 1) **(7)**

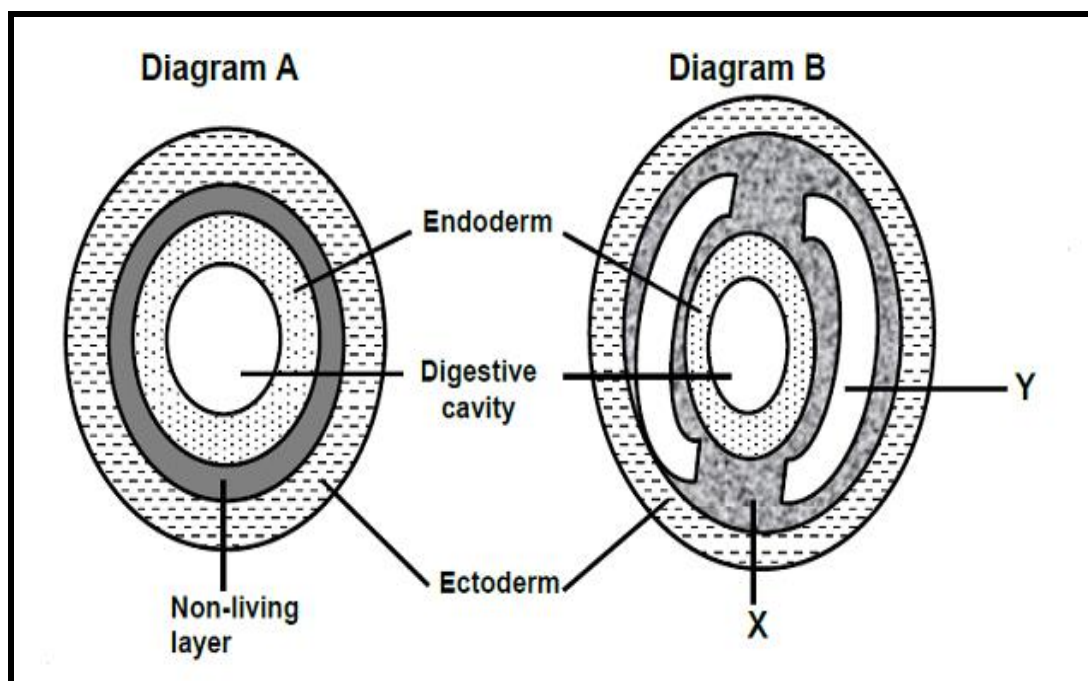
- 1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A and B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1–1.3.3) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 Raw material(s) essential for photosynthesis	A: Oxygen B: Carbon dioxide
1.3.2 Triploblastic animals with a blind gut	A: Platyhelminthes B: Annelida
1.3.3 Produced when glucose is broken down completely	A: Lactic acid B: Ethanol

(3 x 2) **(6)**



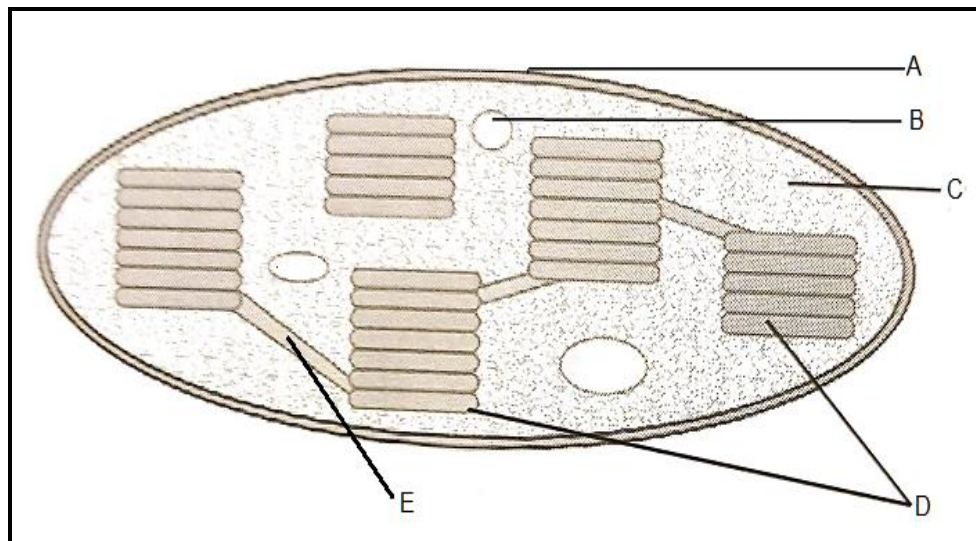
- 1.4 The arrangement of body tissues becomes increasingly complex as animals become more evolved. This has allowed animals to develop different feeding strategies. The diagrams below show the tissue layers in animals.



- 1.4.1 Use letters **A** and **B** to place the diagrams in their correct evolutionary sequence. (1)
- 1.4.2 Name TWO animal phyla represented by diagram B. (2)
- 1.4.3 Provide labels for X and Y. (2)
- 1.4.4 Describe TWO advantages of structure X. (4)
- 1.4.5 Which of the two organisms, **A** or **B** is radially symmetrical? (1)
- 1.4.6 Explain ONE advantage of being radially symmetrical. (2)
- (12)**



- 1.5 The following drawing shows an organelle found in certain plant cells. Study the diagram and answer the questions that follow.

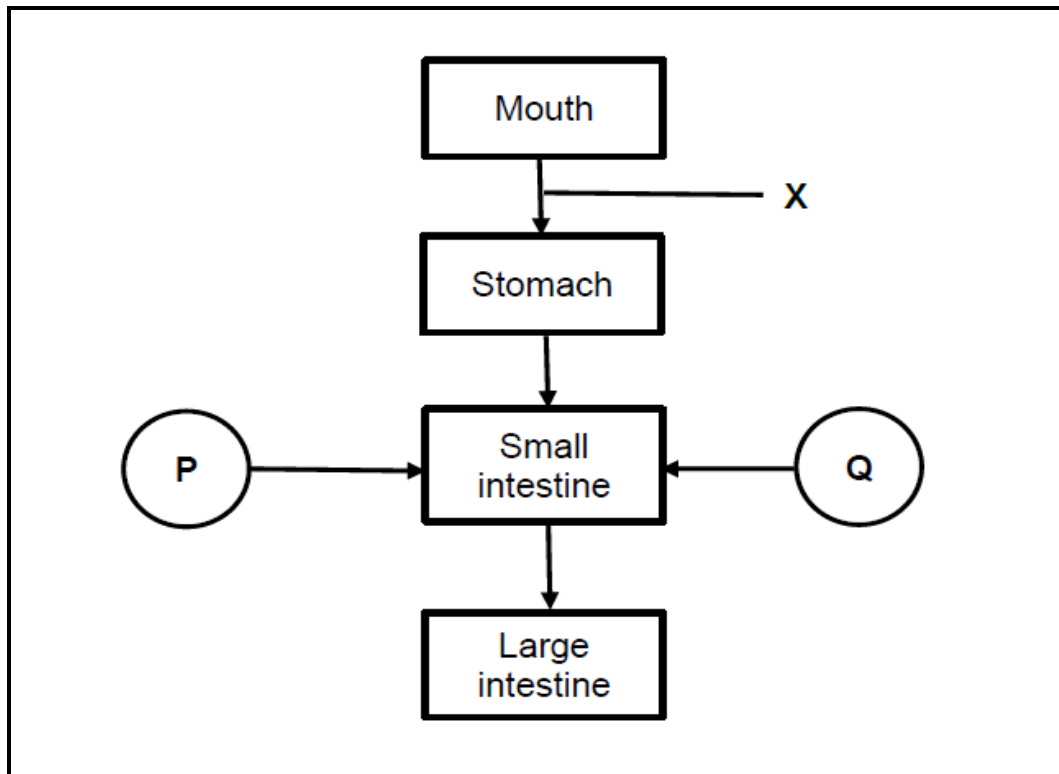


- 1.5.1 Name TWO types of plants cells in which this organelle occurs in relatively large numbers. (2)
- 1.5.2 Identify:
- (a) Part C (1)
 - (b) Structure B (1)
- 1.5.3 Name the part that will be active in light only. (1)
- (5)**

TOTAL SECTION A: 50

SECTION B**QUESTION 2**

2.1 The diagram below shows a diagrammatic representation of the digestive system.

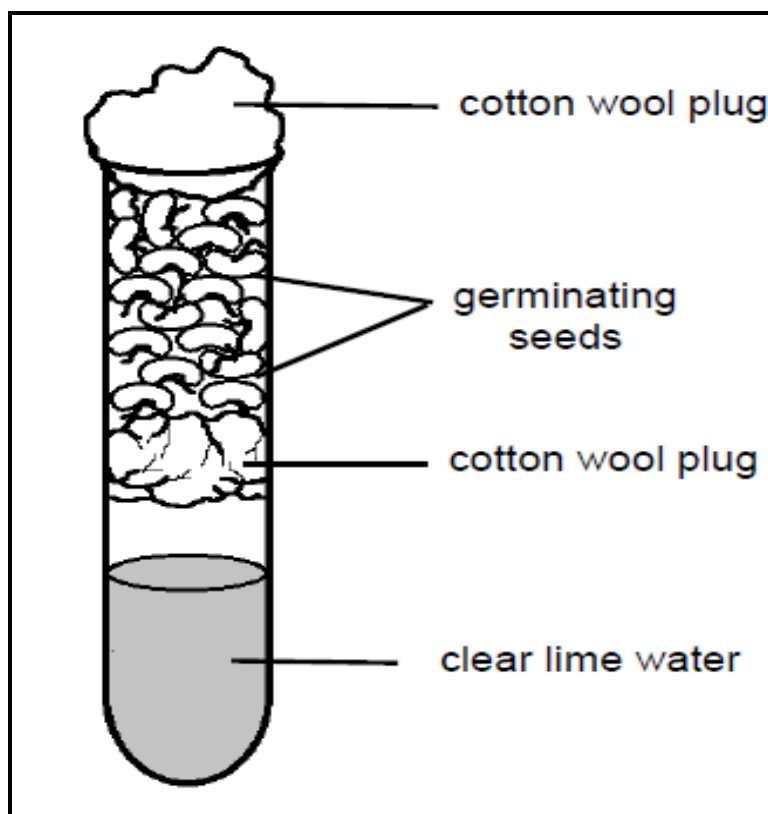


- 2.1.1 Name the part of the alimentary canal represented by **X**. (1)
- 2.1.2 By which process is food moved through structure **X**? (1)
- 2.1.3 Name the glands **P** and **Q** that release their secretions into the intestine. (2)
- 2.1.4 Name the part of the alimentary canal where the digestion of proteins begins. (1)
- (5)**

2.2 The apparatus below was used to carry out an investigation on aerobic respiration

The experiment was set up as follows:

- 17 seeds of the same kind were used.
- The seeds and the apparatus were sterilised before the investigation.
- Once set up, the apparatus was placed in a dark cupboard at 35 °C
- A control was also set up.



- 2.2.1 Formulate a hypothesis for this investigation. (2)
- 2.2.2 What is the significance of sterilising the seeds before they are used? (1)
- 2.2.3 Give TWO controlled variables in this investigation. (2)
- 2.2.4 Explain how you would set up a control for this investigation. (3)
- 2.2.5 Explain why germinating seeds were used in this investigation. (2)
- (10)**



2.3 Read the following information and answer the questions that follow.

Pesticide: DDT and Dieldrin

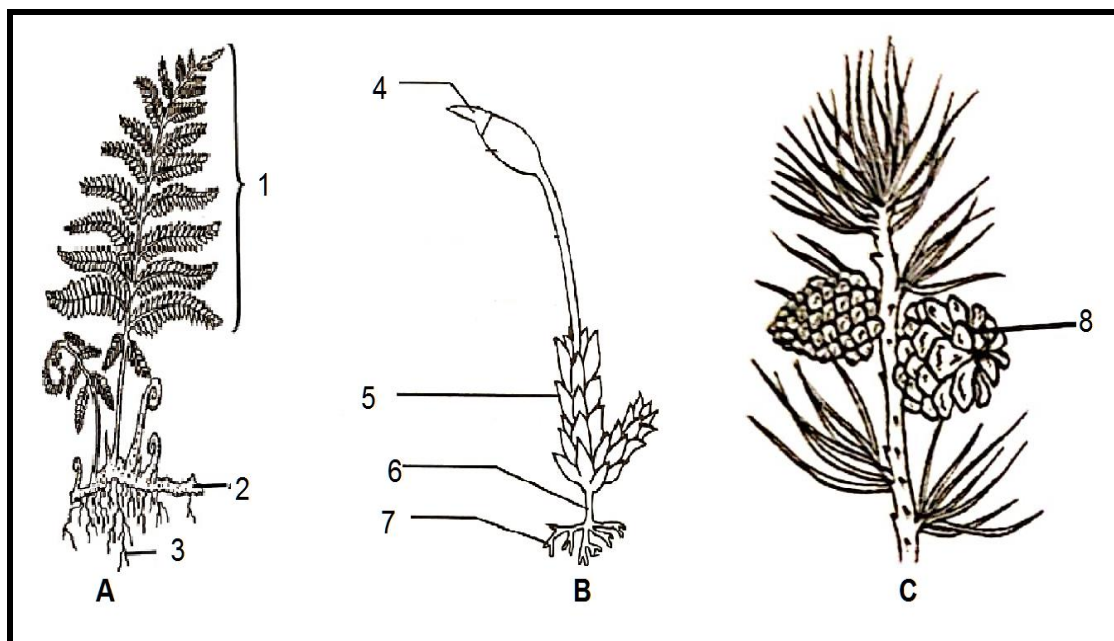
Many years ago, mosquito-breeding areas were sprayed with pesticides like DDT and Dieldrin. It was initially very effective against the mosquitoes. However, scientists found that both DDT and Dieldrin were non-biodegradable and are toxic, causing much harm to the environment and other organisms. These pesticides covered the sprayed plants, which were eaten by herbivores which in turn were eaten by carnivores. When the rainwater washed the residues off the plants, they ended up in the water table. The pesticides collected in rivers and other water masses, affecting the aquatic plant and animal life. In 1972, the use of these pesticides was banned internationally. The Department of Agriculture has instituted strict laws to ensure that only pesticides and herbicides that are approved are used to spray crops and to control mosquitoes. These laws have been put in place to ensure that there are legal maximum residue limits for the concentrations of pesticides and herbicides.

[Source: Sivlia education for the nation]

- 2.3.1 Name the mosquito that spreads malaria. (1)
- 2.3.2 Why is DDT and Dieldrin no longer an effective way to control mosquito breeding areas? (1)
- 2.3.3 Provide TWO reasons why DDT and Dieldrin were banned in 1972. (2)
- 2.3.4 Suggest an alternative for the use of pesticides. (1)
- 2.3.5 Mention any THREE strategies that can be followed to prevent mosquitoes from biting us, if we happen to be a visitor in a high-risk malaria area. (3)
- 2.3.6 Give a brief outline of the lifecycle of the malaria parasite and how it is transmitted from one individual to another. (4)
- (12)**



2.4 Study the diagrams below of different plant groups.



- 2.4.1 Identify the plant group under which A and C are classified. (2)
- 2.4.2 Which generation is represented by the sketch in B. (1)
- 2.4.3 Provide labels for parts 1, 6 and 8 (3)
- 2.4.4 Give the name of the structure that develops from germinated spore of plant A. (1)
- 2.4.5 State TWO advantages of seeds over spores (2)
- 2.4.6 Explain why plant C is not dependent on water for fertilization. (4)
- (13)**

TOTAL QUESTION 2: 40



QUESTION 3

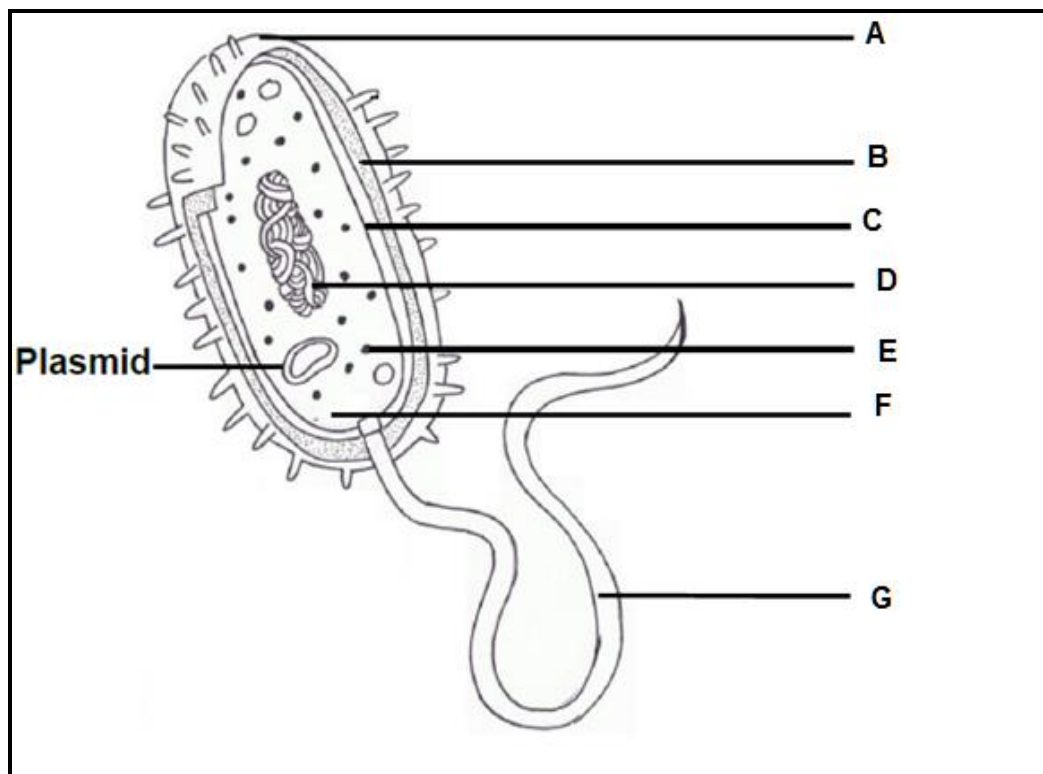
- 3.1 An experiment was carried out to calculate the rate of photosynthesis in a group of plants at different concentrations of carbon dioxide. This was repeated at two different light intensities. The results are given below.

CO ₂ concentration (%)	Rate of photosynthesis (Arbitrary units)	
	Low light intensity	High light intensity
0,00	0	0
0,02	20	20
0,04	29	35
0,06	35	47
0,08	39	68
0,10	42	84
0,12	45	89
0,14	46	90
0,16	46	90
0,18	46	90

- 3.1.1 Identify the dependent factor in the above graph. (1)
- 3.1.2 Up to what values does CO₂ concentration act as a limiting factor at high light intensities? (2)
- 3.1.3 Name TWO limiting factors of photosynthesis other than the ones mentioned in QUESTION 3.1.2. (2)
- 3.1.4 Draw a line graph to represent the rate of photosynthesis under various concentrations of CO₂ at low light intensity. (6)
- (11)**



3.2 The diagram below represents a single bacterial cell.



3.2.1 Provide labels for parts A and B. (2)

3.2.2 State functions of parts labelled D and G. (2)

3.2.3 Suggest a reason as to why disease - causing bacteria have thick layer of the part labelled A. (1)

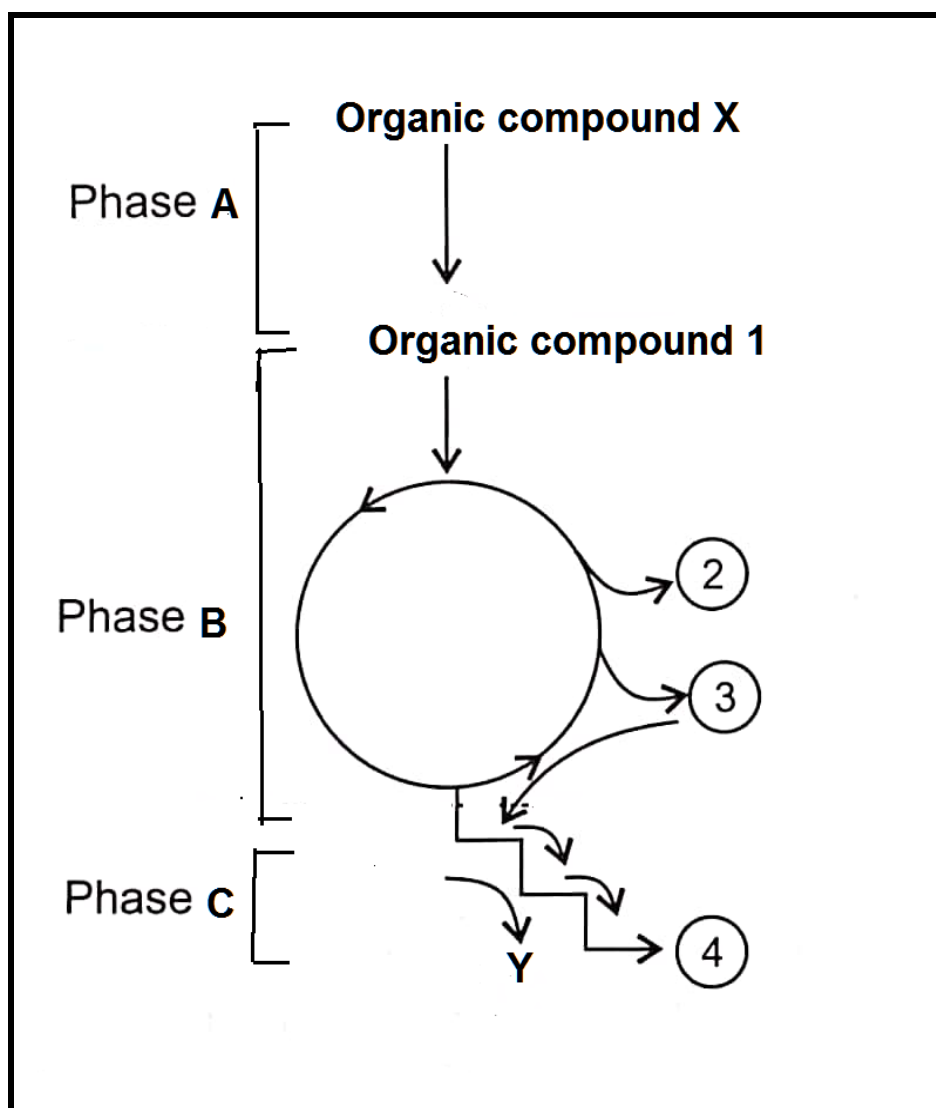
3.2.4 Microorganisms can be used in the production of medicines such as insulin and antibiotics.

Describe how the bacterium *E. coli* is used in the production of insulin for the treatment of diabetes.

(5)
(10)



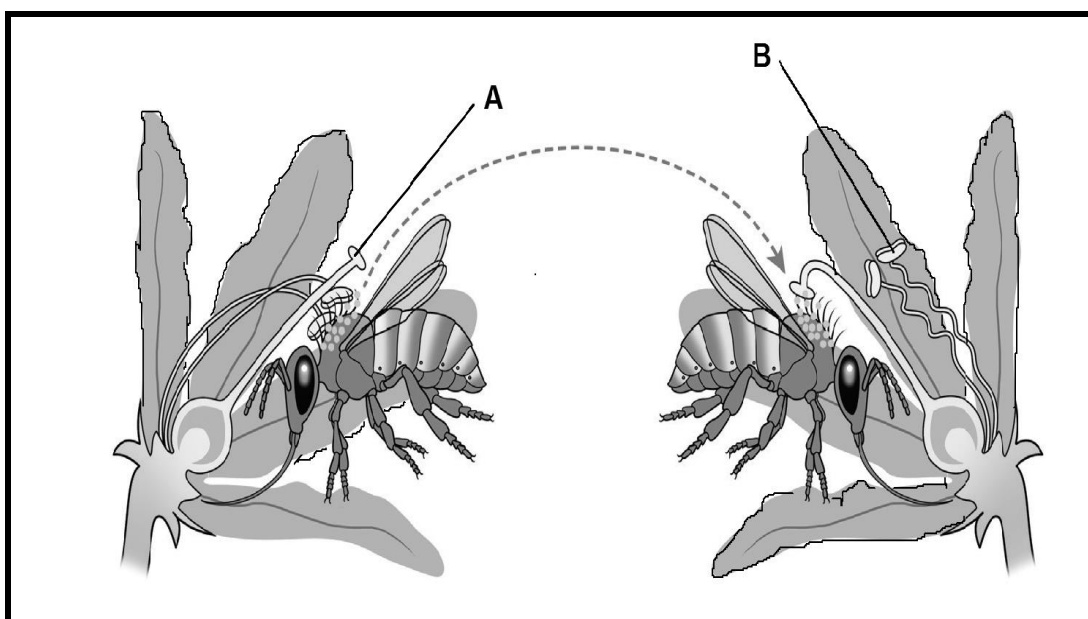
3.3 Study the diagram and answer the questions that follow.



- 3.3.1 Which phases are represented by A, B and C respectively? (3)
- 3.3.2 In which organelle do phases B and C occur? (1)
- 3.3.3 Identify the products numbered 2 and 3. (2)
- 3.3.4 Identify organic compound X (1)
- 3.3.5 Tabulate **TWO** differences between aerobic and anaerobic respiration. (5)
- 3.3.6 State what happens to compound **1** if no oxygen is present? (2)
- (14)**



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



3.4.1 Identify and define the process represented in the above diagram. (3)

3.4.2 Label parts numbered A and B respectively. (2)

(5)

TOTAL QUESTION 3: 40

SECTION C

QUESTION 4

Describe how the principle of negative feedback operates in controlling the glucose concentration of the blood in a normal healthy person and mention causes and the symptoms of diabetes.

Content: (17)

Synthesis: (3)

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

TOTAL SECTION C: 20

GRAND TOTAL: 150

