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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 11

ENGLISH FIRST ADDITIONAL LANGUAGE

LIFE SCIENCES

JUNE 2017

MARKS: 150

TIME: 2½ hours

This question paper consists of 14 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 should be done in pencil and labeled 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 all drawn to scale.
9. Do NOT use graph paper.
10. You may use a non- programmable calculator, protractor and a compass where necessary.
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 1.1.9) in your ANSWER BOOK, for example 1.1.10 D.

1.1.1 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.

1.1.2 Which of the following substances will increase inside a muscle cell during strenuous exercise?
- A ATP
- B glucose
- C alcohol
- D lactic acid

1.1.3 The part of a plant that receives the pollen during pollination is the …
- A Stigma.
- B Anther.
- C Ovule.
- D Petal.

1.1.4 The following are involved in the process of cellular respiration:
- 1 Energy
- 2 Carbohydrates
- 3 Carbon dioxide
- 4 Water
- 5 Oxygen

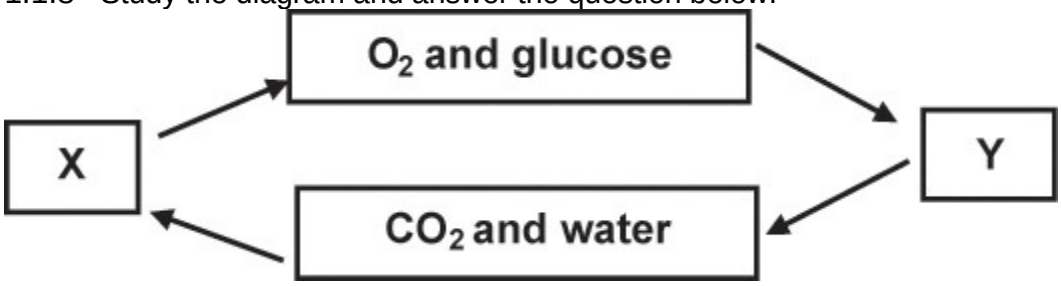
Which of the following correctly represent their involvement in the process?
- A 1 + 2 = 3 + 4 + 5
- B 2 + 5 = 1 + 3 + 4
- C 2 + 3 + 1 + 4 + 5
- D 2 + 4 = 1 + 3 + 5

1.1.5 Some people grow their plants in greenhouse tunnels…
- A to keep the plants in the dark.
- B to regulate the amount light and heat provided for the plants.
- C to grow a mixture of crops.
- D to increase the plant's rate of respiration.

1.1.6 Which of the following concerning bacteria is incorrect?
A Bacteria are prokaryotic.
B All bacteria cause diseases.
C Certain bacteria are autotrophic.
D Certain bacteria are anaerobic

1.1.7 Which of the following shows the correct path of air movement during inhalation?
A Trachea → bronchus → bronchioles → alveoli
B Alveoli → bronchioles → trachea → bronchus
C Alveoli → bronchioles → bronchus → trachea
D Bronchus → bronchioles → trachea → alveoli

1.1.8 Study the diagram and answer the question below.



Radiant energy is…
A Not involved in these processes.
B Needed by both X and Y.
C Needed by Y and released by X.
D Needed by X only.

1.1.9 Which statement best describes the relationship between a parasite and its host?
A the host is harmed while the parasite benefits.
B the parasite is harmed while the host benefits.
C both host and parasite benefit.
D the parasite benefits and the host is not affected at all. (9 x 2) **(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 to 1.2.7) in your ANSWER BOOK.

1.2.1 Seed producing plants
1.2.2 Keeping the internal environment at constant level always
1.2.3 Small lymph vessels in the villi of the small intestine
1.2.4 A gut which has two openings allowing for the one directional passage of food and wastes.
1.2.5 An organism that causes disease
1.2.6 The sexual, gamete-producing stage in the life cycle of a plant showing alternation of generations
1.2.7 The type of anaerobic respiration that takes place in yeast cells

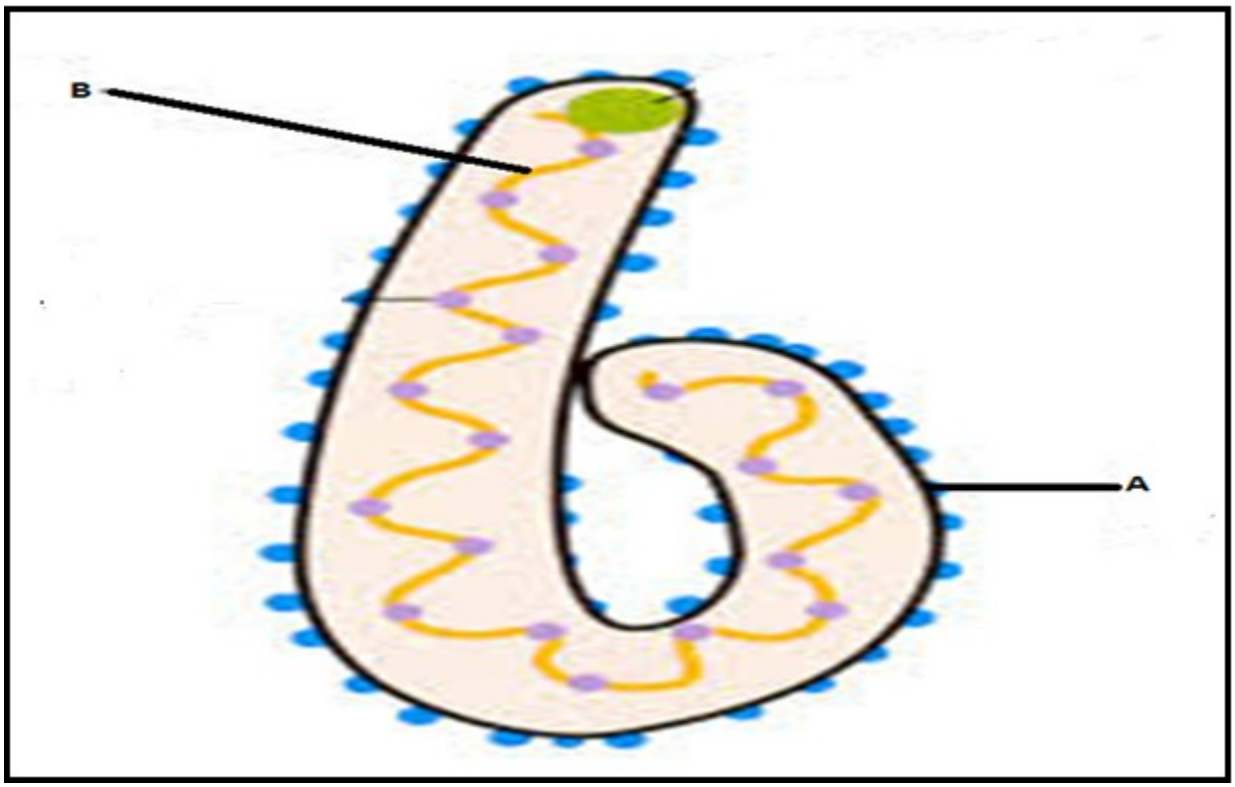
(7x1) **(7)**

1.3 Indicate whether each of the descriptions 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 to 1.3.5) in the ANSWER BOOK.

COLUMN I	**COLUMN II**
1.3.1 Controls blood glucose level	A: Insulin B: Glucagon
1.3.2 Phylum with segmented bodies and appendages.	A: Arthropoda B: Chordata
1.3.3 Radially symmetrical	A: Cnidaria B: Porifera
1.3.4 Produced when glucose is broken down completely	A: Lactic acid B: Ethanol
1.3.5 Function of the liver	A: Detoxification B: Deamination

(5 x 2) **(10)**

1.4 Study the diagram which shows an organism that causes Ebola and answer the questions that follow.



1.4.1 Identify the type of organism shown in the diagram. (1)

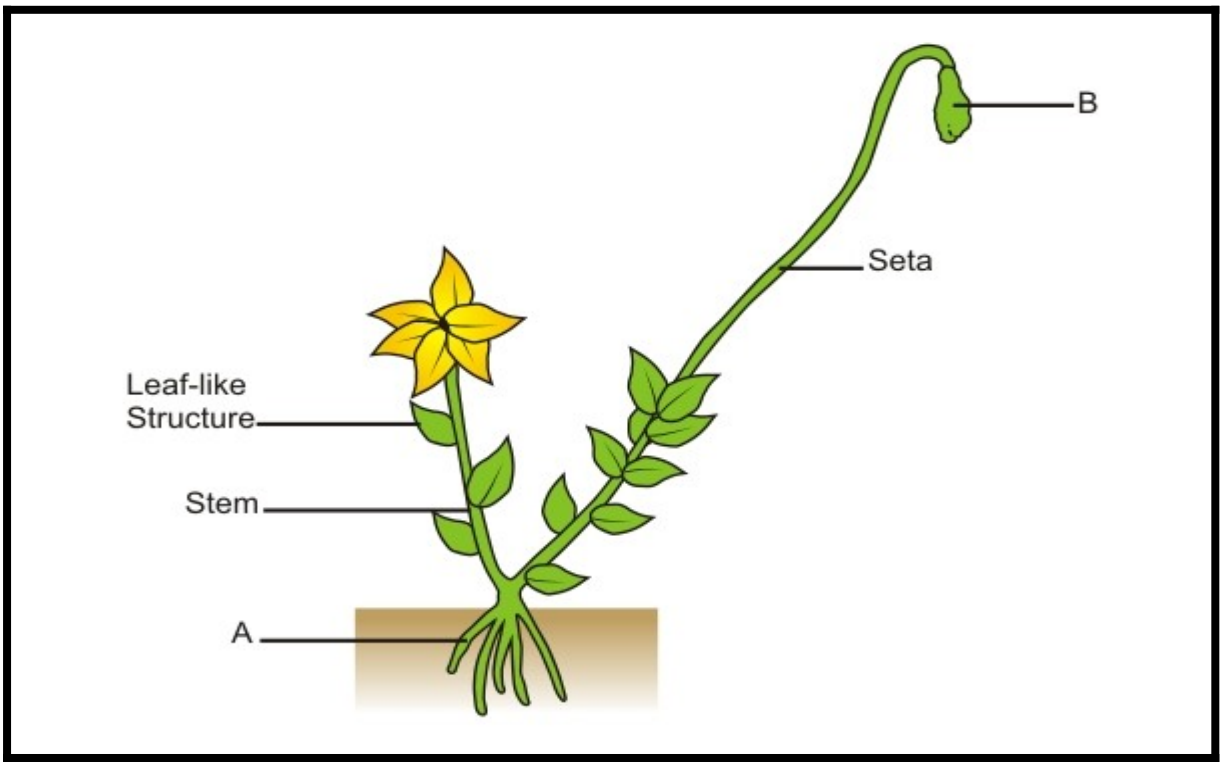
1.4.2 Name the structures labelled A and B. (2)

1.4.3 Describe how Ebola is transmitted (2)

1.4.4 A person infected with the organism can get an antibiotic prescription from the doctor.
Explain why this is possible even if antibiotics cannot kill the organism.

(2)
(7)

1.5 Study the diagram of a Bryophyte below and answer the questions that follow.



1.5.1 Identify the structures labelled A and B. (2)

1.5.2 What are the functions of structure A? (2)

1.5.3 What generation does A belong to? (1)

1.5.4 What is produced in Structure B? (1)

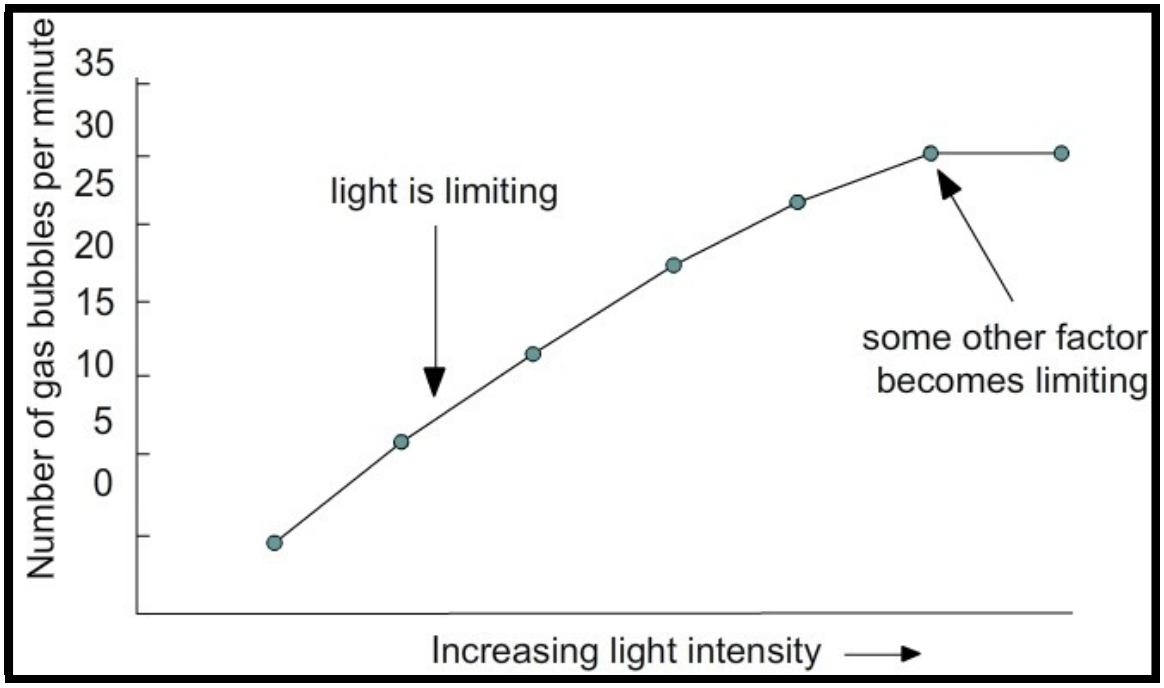
(6)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The graph below shows effect of light intensity on the rate of photosynthesis.



2.1.1 Identify the following

(a) Independent variable in this investigation?
(b) Dependent variable? (2)

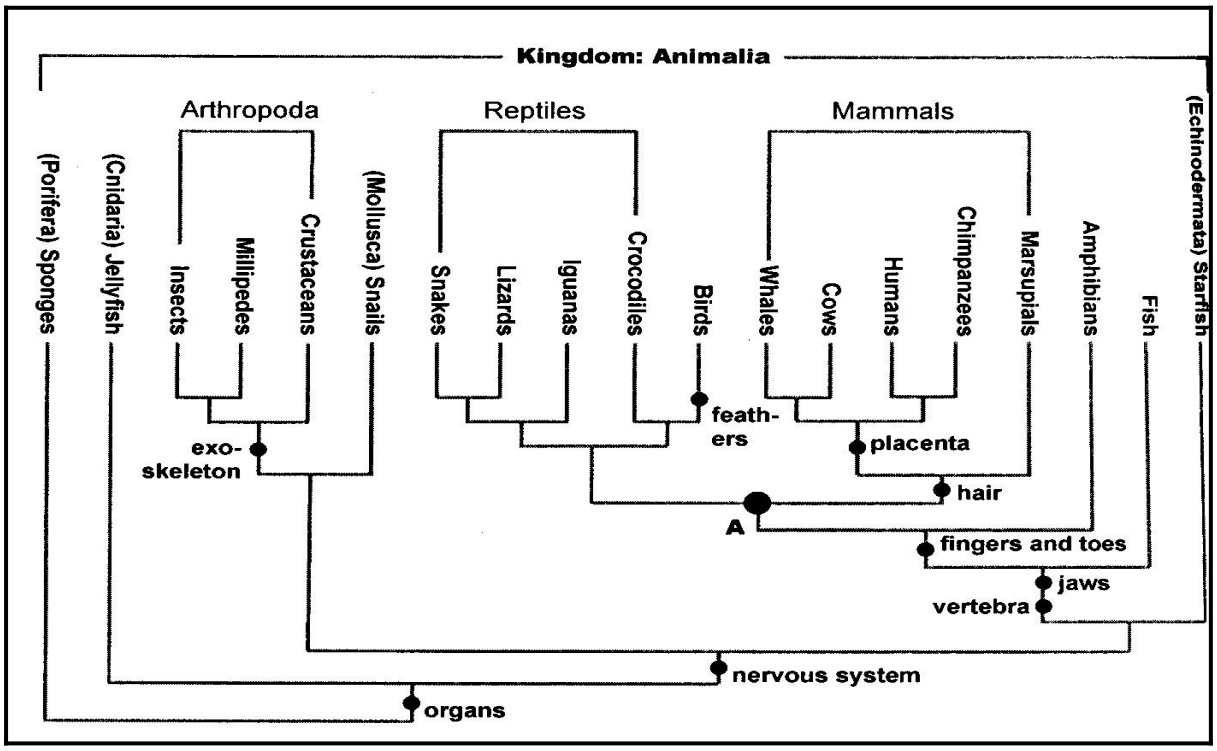
2.12 How was rate of photosynthesis measured? (1)

2.1.3 What is the highest reading of the rate of photosynthesis? (2)

2.1.4 Name some factors that are limiting the rate of photosynthesis in the graph above. (2)

(7)

2.2 Study the phylogenetic tree below and answer the questions that follow.



2.2.1 What animal group(s)

(a) does not have the organ level of organisation? (2)

(b) has no nervous system? (2)

(c) has a nervous system, exoskeleton but no vertebrae? (2)

(d) are members of Phylum Arthropoda (3)

(e) of the vertebrates has no fingers and toes? (1)

(f) has feathers? (1)

2.2.2 Which group of the mammals does not have a placenta? (1)

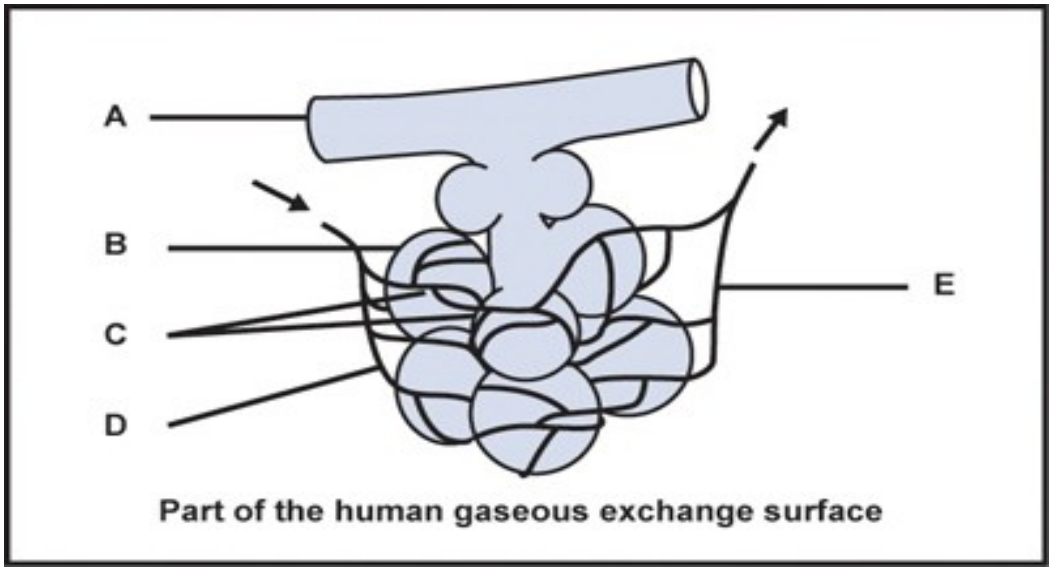
2.2.3 What property, on this phylogenetic tree, distinguishes birds from crocodiles ? (1)

2.2.4 If A were a hypothetical common ancestor, which animal group(s) evolved from it? (2)

2.2.5 Mention 4 properties from this phylogenetic tree which all mammals have in common? (4)

(19)

2.3 Study the diagram of part of the human gaseous exchange surface and answer the questions that follow.



2.3.1 Provide labels for parts A and B respectively. (2)

2.3.2 List two features that are visible on the diagram above that make it efficient for gaseous exchange in humans. (2)

2.3.3 State one major difference between the composition of the blood in vessel D and vessel E. (2)
(6)

2.4 During an investigation on a field trip, a professor found **three** unidentified organisms. After examining their external and internal structural characteristics using a microscope, he recorded his observations as follows:

ORGANISM A	**ORGANISM B**	**ORGANISM C**
Bilateral symmetrical	Bilateral symmetrical	Asymetrical
Triploblastic	Triploblastic	Diploblastic
Coelomate	Coelomate	No coelom
Chitinous Exoskeleton	Coelomic Fluid	

2.4.1 Name the different phyla to which organisms A, and B belong. (2)

2.4.2 Arrange the 3 phyla mentioned in the table above in the correct order from the most primitive to the most developed. (3)

2.4.3 Describe ONE disadvantage of an exoskeleton in members of group A. (2)
(7)

QUESTION 3

3.1 Most agriculturally important plants are angiosperms. In South Africa, agriculture is an important source of income and employment. The table shows the Gross Farming Income earned in South Africa from field crops and horticultural crops for the financial years 2007/2008 and 2008/2009.

Type of crop	Gross farming income in the year 2007/2008 (Millions of Rands)	Gross farming income in the year 2008/2009 (Millions of Rands)
Field crops	23 800	37 800
Horticultural crops	26 200	30 200

3.1.1 Calculate the change in income generated by farming of field crops in the year 2007/2008 to 2008/2009. (3)

3.1.2 Draw a bar graph showing the Total Gross Farming Income for ALL crops for the years 2007/2008 and 2008/2009. (6)

3.1.3 Horticultural crops include citrus fruit, deciduous fruit, and subtropical fruit and vegetables.

(a) In addition to fresh table grapes and dried fruit, what product is made from grapes grown in South Africa? (1)

(b) In addition to income generated from the sale of crops, how else does agriculture benefit the economy of South Africa? (2)

3.1.4 Field crops include maize, sunflower, sugar cane and wheat.
(a) Which of these crops is a dicotyledonous angiosperm? (1)

(b) Seeds are the main source of food for many mammals including humans. Draw a labelled diagram of a bean seed showing the embryo. (4)
(17)

3.2 Study the nutritional information for 80 g of a breakfast cereal that is shown in the table below. Use the information to answer the following questions.

	Value per 80 g
Energy	1140 K j
Protein	10,0 g
Carbohydrate	54,0 g
Saturated fat	0,2 g
Unsaturated fat	1,4 g
Cholesterol	Nil
Vitamins	8,8 mg
Dietary fibre	8,0 g

3.2.1 Which nutrient is abundant in this cereal? (1)

3.2.2 Name ONE function that the nutrient in 3.2.1 performs in the human body. (1)

3.2.3 Give TWO reasons why you think it is important that nutritional information is provided on food packaging. (2)
(4)

3.3 Tabulate THREE differences between aerobic and anaerobic respiration. (7)
(7)

3.4 A scientist designed an investigation to determine whether microbes were present on human hair.

The procedure was as follows:

- A sterile Petri-dish (round, flat container) containing sterile nutrient agar (substance on which microbes feed and grow) was used.
- The lid of the Petri-dish was removed carefully and a strand of human hair was laid on the surface of the agar.
- The lid was then replaced and the Petri-dish was placed in an incubator (apparatus in which temperature can be controlled) for 48 hours.
- The dish was then examined

3.4.1 What is meant by a sterile Petri-dish? (1)

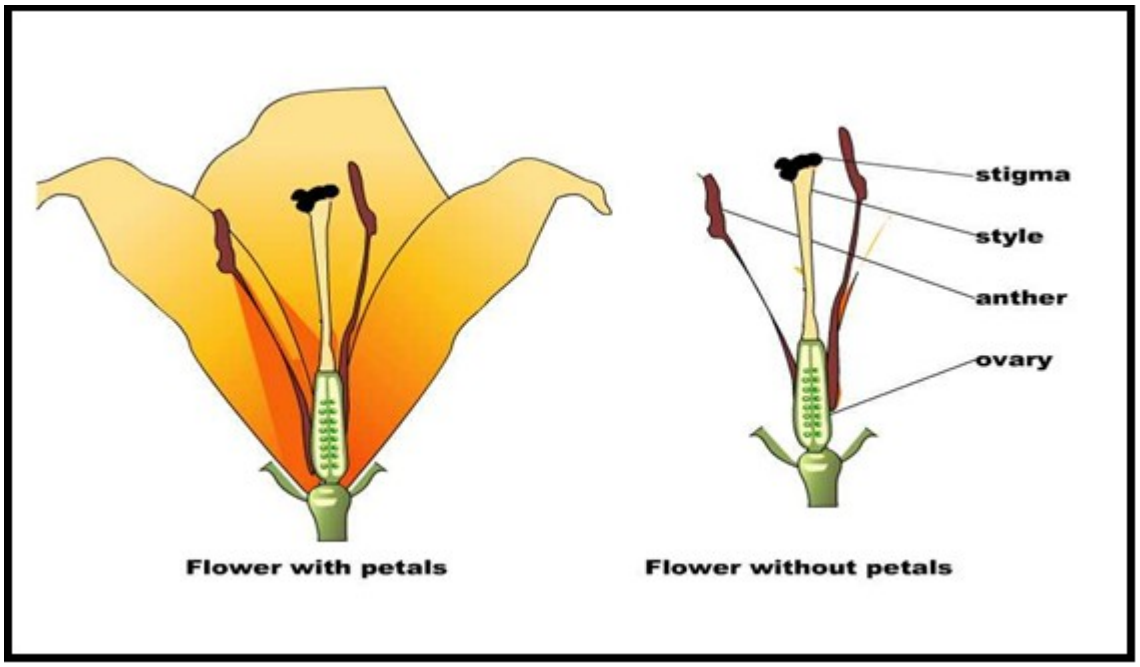
3.4.2 State a hypothesis for testing for the above investigation. (2)

3.4.3 At which one of the following temperatures (0ºC, 30ºC, 80ºC, 100ºC) should the incubator have been set? (1)

3.4.4 Explain your answer to Question 3.4.3 (2)
(**8)**

3.5 An investigation was done to determine the role of petals in insect pollination in apple flowers. When flowers are self-pollinated, the pollen tubes grow a little into the stigma and style and fertilisation does not take place.

- 10 flowers with petals and 10 flowers without petals were used.
- After two days the flowers were prevented from further pollination.
- After seven days the extent of pollination and fertilisation was recorded.



The diagrams below show the appearance of the flowers with and without petals.

The results are shown in the table below.

	NUMBER	
	Flower with petals	**Flower without petals**
Pollen on stigma	158	25
Pollen tubes in the style	86	8
Ovules fertilised	38	4

3.5.1 Give an explanation for the presence of more pollen on the stigmas of the flowers with petals than on the flowers without petals. (2)

3.5.2 Explain why there are more pollen tubes present in the styles of both

types of flowers than the number of ovules fertilised. (2)

3.5.3 State THREE ways in which this investigation could be improved. (3)

(7)

(40)

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Describe the process of digestion of a sandwich made up of two slices of bread, polony, cheese and lettuce through the human alimentary canal. In your essay mention the the process of digestion as it is taking place in the mouth, stomach as well as in the small intestine.

Content : (17)

Synthesis: (3)

(20)

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

TOTAL SECTION C: 20

GRAND TOTAL :150