SECTION A (40 MARKS)

Answer ALL the questions in this section in the spaces provided.

1. a) Define the following:

i) Photosynthesis (1 mark)

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ii) Chemosynthesis (1 mark)

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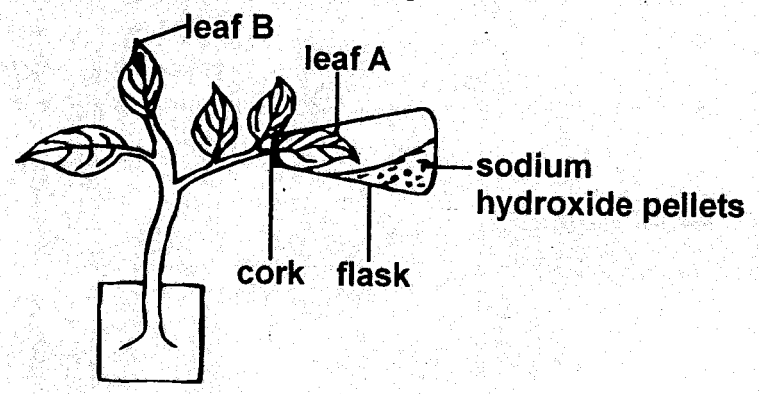
b) Study the diagram below and answer the questions that follow.



i) What is destarching? (1 mark)

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ii) Giving reasons state the expected results when leaf A and leaf B are tested for starch.

Leaf A (1 mark)

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Reason (1 mark)

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Leaf B (1 mark)

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Reason (1 mark)

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iii) In test for starch, why should methylated spirit be boiled indirectly? (1 mark)

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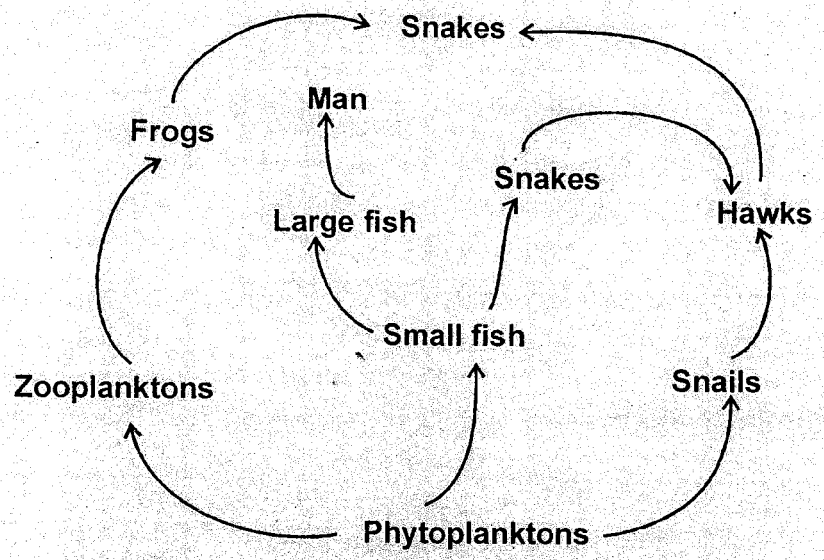
2. The diagram below represents a feeding relationship in an ecosystem.



a) Distinguish between a food chain and a food web. (1 mark)

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b) Name the type of ecosystem represented by the above food web. (1 mark)

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c) Name the organisms in the food web that are producers. (1 mark)

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d) i) Write food chain that ends with the hawk as a tertiary consumer. (1 mark)

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ii) State two short term effects on the above ecosystem if all the small fish were killed. (2 marks)

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e) How does oil spills lead to death of fish. (1 mark)

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f) Name the method you would use to estimate the population of small fish in the ecosystem. (1 mark)

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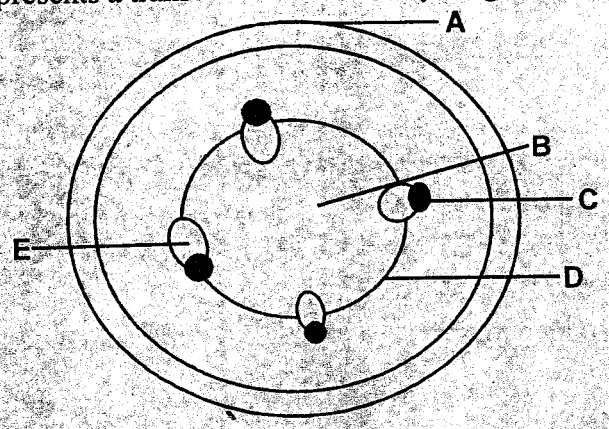
3. The diagram below represents a transverse section of a young stem.



a) Name the parts labelled **A** and **B**. (2 marks)

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b) State the functions of the parts labelled **C** and **D**. (2 marks)

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c) Name the compound that dissociates to release oxygen in humans. (1 mark)

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d) What is tissue fluid? (1 mark)

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e) Name the process that leads to formation of tissue fluid. (1 mark)

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f) Name the blood vessels that nourishes the heart. (1 mark)

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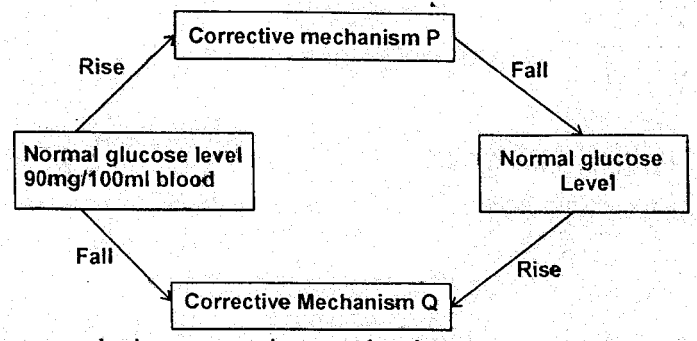
4. The diagram below shows how blood glucose in mammalian body is regulated.



a) Explain what happens during corrective mechanism **P**. (3 marks)

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b) Name **two** organs involved in corrective mechanisms **P** and **Q**. (2 marks)

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c) Why should glucose level be maintained constant? (2 marks)

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d) What is osmoregulation? (1 mark)

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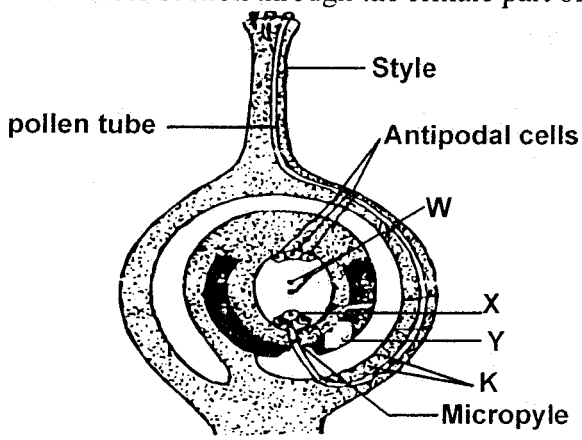
5. The diagram below shows a cross section through the female part of a flower.



a) Name the structures labelled W, X and Y. (3 marks)

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b) State **two** functions of the pollen tube. (1 mark)

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c) What happens to antipodal cells after fertilization? (1 mark)

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d) What does the term double fertilisation mean in flowering plants? (1 mark)

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e) Name the structure labelled K and state their role. (2 marks)

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SECTION B

Answer question 6 (compulsory) and any other question from this section.

6. During germination and growth of a cereal the dry weight of endosperm, the embryo and total dry weight were determined at two day intervals for fourteen days. The results are as tabulated below.

Time in days	**Dry weight (mg)**		
	Endosperm	**Embryo**	**Total**
0	47	5	52
2	44	5	49
4	39	8	47
6	22	17	39
8	10	28	38
10	4	35	39
12	2	42	44
14	2	44	46

a) Using the same axis, draw graphs for dry weight of endosperm, embryo, and total dry weight against time.

(7 marks)

b) What was the average dry weight of embryo on day 2? (1 mark)

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c) Account for the shape of the curve for
i) Embryo from day 2 to day 12. (2 marks)

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ii) Total dry weight (gm) from day 0 to day 14. (3 marks)

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d) After how long was the dry weight of;
i) Endopserm 30mg. (1 mark)

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ii) Emryo 35mg (1 mark)

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e) Explain the role of water in seed germination. (3 marks)

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f) Other than water what other **two** environmental factors are required for seed germination? (2 marks)

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7. a) What is the significance of transpiration to plants. (3 marks)
b) Describe how urea is formed. (5 marks)
c) Outline four characteristics of class arachnida. (4 marks)
d) Explain four factors determine energy requirements in human beings. (8 marks)

8. a) Apart from the stomata, name **two** other sites where gaseous exchange takes place in terrestrial plants. (2 marks)
b) Describe the mechanism of opening and closing of the stomata in reference to photosynthetic theory. (18 marks)