SECTION A (40 Marks)

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

1. a) Differentiate between co dominance and complete dominance as used in genetics. (2 marks)

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b) In humans, the presence of rhesus antigens makes one rhesus positive. The gene for the presence of rhesus positive is completely dominant over the gene for its absence.

i) Using R to represent the rhesus positive gene, work out the inheritance of rhesus antigen in a marriage between a homozygous rhesus positive man and rhesus negative woman. (3 marks)

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ii) What is the probability that their children will be rhesus positive? (1 mark)

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iii) In this marriage it was noted that after the birth of their first born child the woman miscarried the subsequent pregnancies. Explain this situation. (2 marks)

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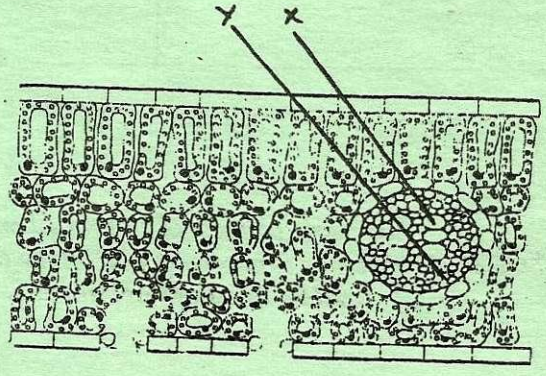
2. The diagram below is a transverse section of a leaf.



a) What is the role of X and Y in nutrition in plants? (2 marks)

X .....

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Y .....

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b. A student put olive oil in a test tube and then added a certain solution K that broke down the oil into droplets.

i) Name the process that took place in the test tube. (1 mark)

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ii) State the significance of the process named in b. (i) above in man. (2 marks)

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(c) Name the:-

(i) Digestive juice in humans that has the same effect as the solution K. (1 mark)

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(ii) Region of alimentary canal into which the digestive juice is secreted. (1mark)

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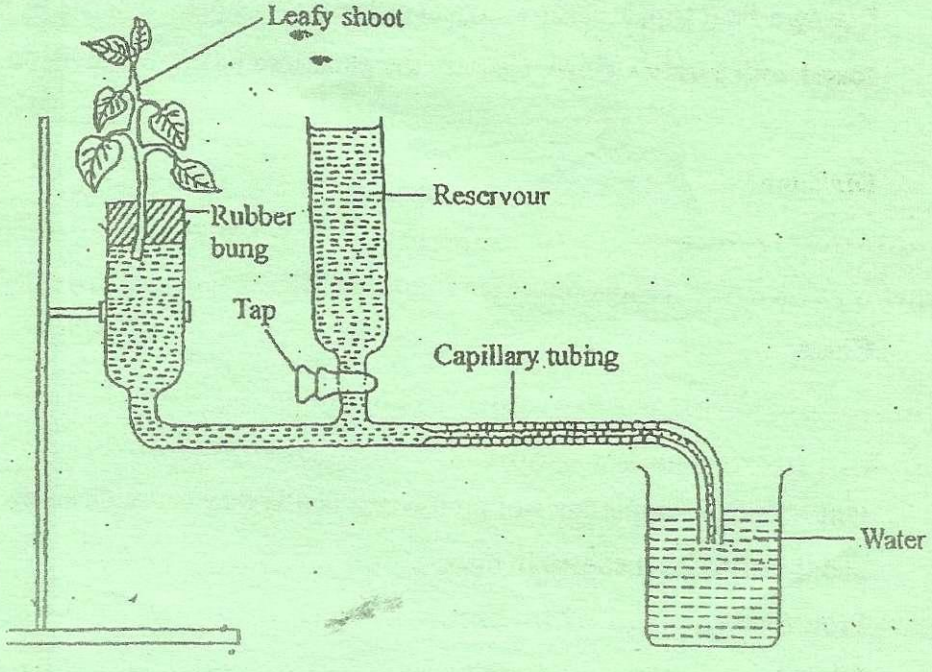
3. A set up that was used to investigate a certain process in plants is shown below:—



a) What is this apparatus used for? (1mark)

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b) When setting up this experiment, certain precautions must be taken
State three of these precautions. (3 marks)

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c) Apart from transport, state two other functions of the components of mammalian blood. (2 marks)

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d) State two differences in composition of blood in the hepatic artery and hepatic portal vein. (2 marks)

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4. a) During a field trip, a Form 3 student came across a plant hearing flowers and large green leaves with parallel Veins. Classify the plant into its correct division and class. (2marks)

Division

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Class

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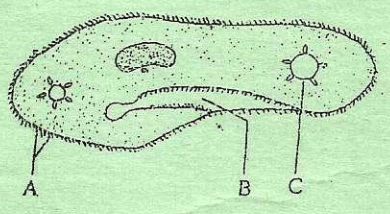
b) One economic importance of protozoans is that they cause diseases. Name one protozoan and the diseases it causes in man. (2 marks)

Protozoan.....

Disease.....

c) Study the organism below an answer the questions that follow:-



i) State the kingdom to which the organism belongs and give a reason for your answer. (2 marks)

Kingdom.....

Reason.

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ii) Give the function of the structures A and C.

Structure A (1 mark)

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Structure C (1 mark)

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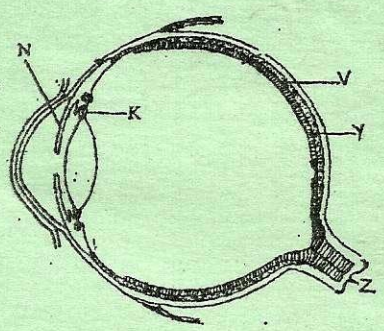
5. Study the diagram below showing a section through a human eye.



a) On the diagram, name the structures marked Z and N. (2 marks)

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b) State adaptations of the part labeled V to its functions. (2 marks)

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c) Explain how light rays from a near object tire focused on the retina. (3 marks)

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d) A Form 4 student could clearly identify friend 10 metres away but could not read a book placed 10 cm away. Name the eye defect that the student was suffering from? (1 mark)

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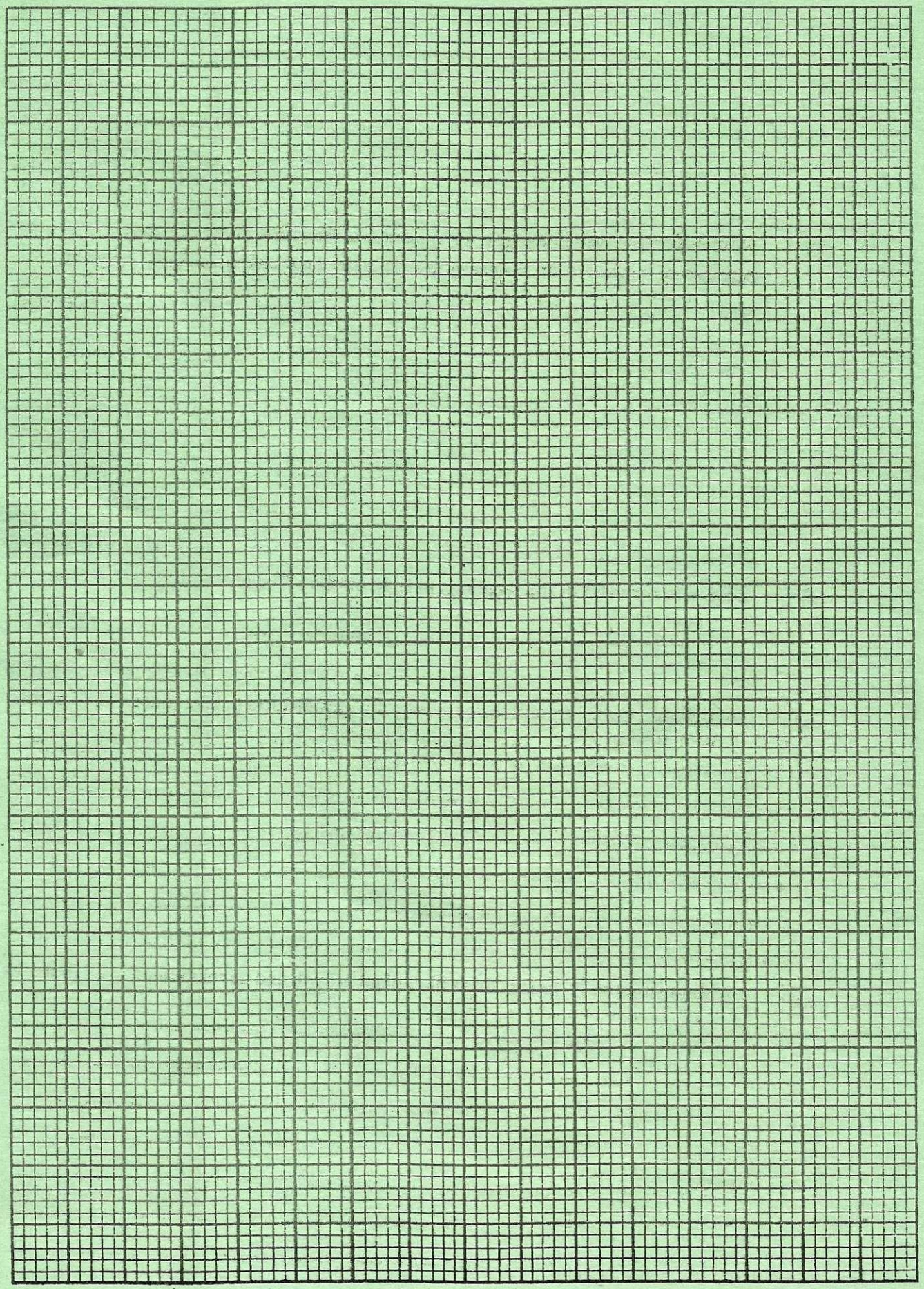
SECTION B (40 Marks)

Answer question 6 (Compulsory) in the spaces provided and either question 7 or 8 in the spaces provided after question 8.

6. A 10 gram samples of wheat grains was germinated on moist filter paper. Half of the sample was grown in normal daylight and the other half in permanent darkness. Samples from each group were weighed every 48 hours. The fresh mass was found in each case and the following results were obtained.

Day	Fresh Mass of Seeds Grown in light (g)	Fresh Mass of seeds grown in darkness (g)
0	10.0	10.0
2	14.0	13.5
4	16.0	16.5
6	20.0	21.0
8	26.5	26.5
10	34.5	32.5
12	44.0	31.5
14	53.5	28.0
16	61.5	25.0
18	68.0	20.5

a) On the same axes, plot graphs of the fresh mass against time. (7 marks)



b) Account for the difference between the two graphs. (3 marks)

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c) What difference would it make to the results of the graph if the dry mass and not the fresh mass was obtained for the seedlings grown in the dark and in the light? Explain.

(3 marks)

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d) What was the mass of the seedlings in light on the 17th day? (1 mark)

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e) State three external conditions necessary for germination to take place. (3 marks)

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f) List down three hormones that affect plant growth and development. (3 marks)

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7. a) Describe the role of the following Hormones in human females:

i) Progesterone. (3 marks)

ii) Luteinising hormone. (4 marks)

iii) Oestrogen. (3 marks)

b) Describe energy flow in a savannah grassland ecosystem. (10 marks)

8. a) How would Darwin explain the evolution of the modern day long necked giraffes. (10 marks)

b) Describe the adaptations of each of the following vertebrae to its functions. (10 marks)

i) Atlas

ii) Thoracic

iii) Lumbar