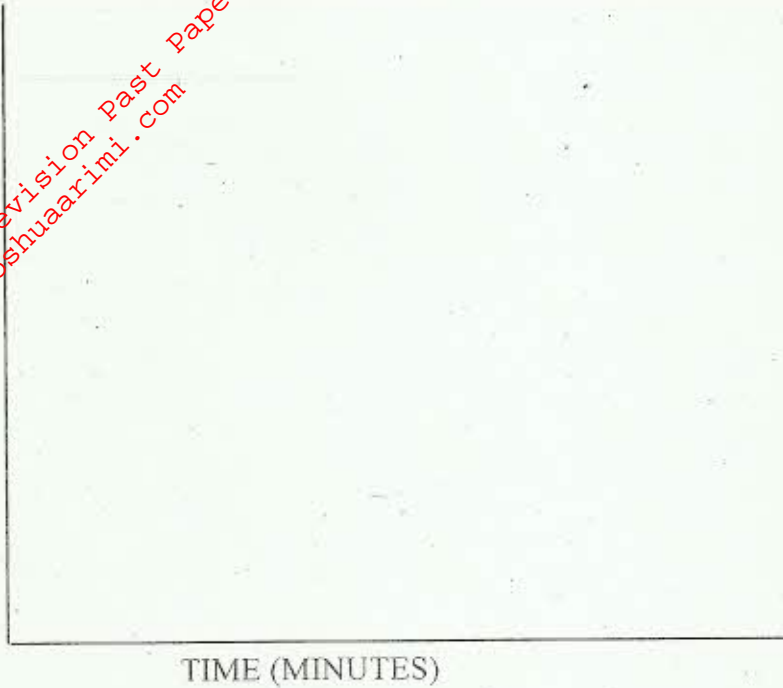


SECTION A (40 MARKS)

1. The graph below shows relative rates of photosynthesis in plants at three different temperatures.



(a) Account for the decrease in the rate of product formation at 45°C from 5 to 20 minutes (3 mks)

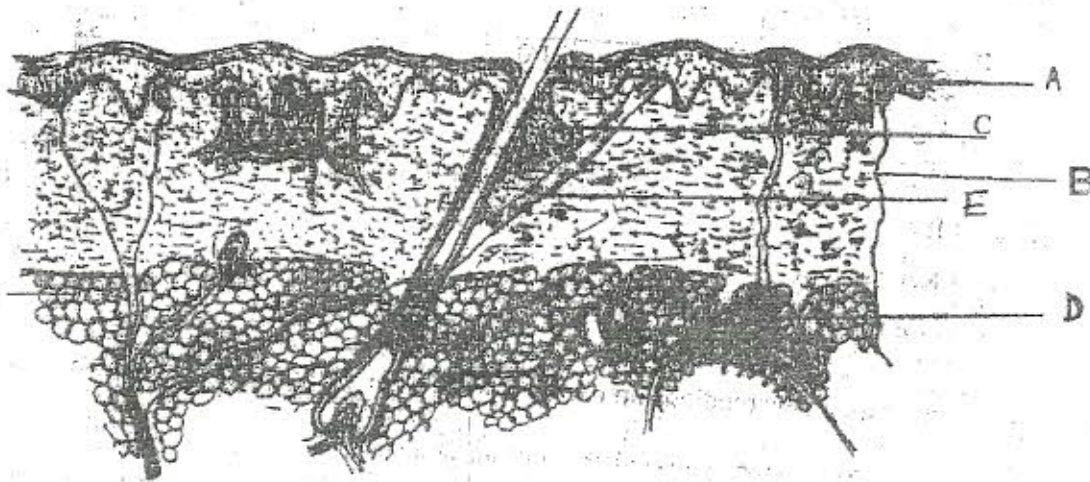
(b) Explain the results at (i) 25°C (1 mark)

(ii) 40°C (1 mark)

(c) Other than temperature state three external factors that affect the rate of photosynthesis.

(3 marks)

2. The diagram below represents a transverse section through a human skin. Use it to answer the questions that follow.



(a) Name the structures labelled A, B, C and D

(2 marks)

A

B

C

D

(b) Give the functions of each of the parts labelled C, D and E.

(3 marks)

C

D

E

(c) State three adaptations present in land animals that help to reduce excessive water loss. (3 marks)

3. The diagrams below show cells from a tissue of a flowering plant.



Cell A



Cell B

(a) (i) Name the cells A and B. (2 marks)

A.....

B.....

(ii) State one way in which the structure of cell A differs from cell B. (1 mark)

(b) (i) In which tissue are these cells found. (1 mark)

(ii) State two functions of the tissue in (i) above. (2 marks)

(c) State two ways in which cell A is adapted to its function in the plant. (2 marks)

4. A cross between a red flowered plant and a white flowered plant produced plants with pink flowers. Using letter R to represent the one for red colour and N for white colour.

(a) What are the parental genotypes? (1 mark)

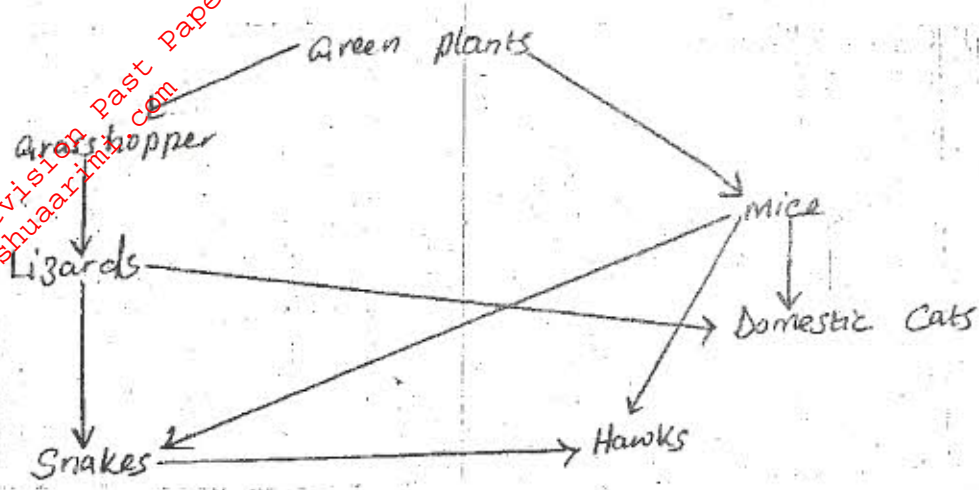
(b) What are the f1 genotypes? (1 mark)

(c) Work out a cross between f1 plants (4 marks)

(d) Give the phenotypic ratio of f2 plants. (1 mark)

(e) Give the genotypic ratio of f2 plants. (1 mark)

5. The figure below represents a feeding relationship in an ecosystem.



- (a) Construct two food chains ending with a tertiary consumer in each case. (2 marks)
- (b) Which organism has the largest variety of predators in the food web. (1 mark)
- (c) Name four secondary consumers in the food web. (2 marks)
- (d) Suggest three ways in which the ecosystem would be affected if there was a prolonged drought. (3 marks)

SECTION B

6. In an experiment to determine the effect of food quality on growth, groups of 10 young rats kept at 28°C were weighed weekly for seven weeks. The results were as shown in the table below. Average weight is expressed in grammes.

Food Used	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Milk Powder	26	32.9	36.4	40.2	43.4	45.5	47
Wheat bran	26	31.7	34.0	36	37	39.1	40.5
Cassava chips	26	27.5	28.3	29	29.5	30	30.2
Milk powder & wheat bran	26	43.5	50.1	63.4	70.8	78.2	84
Milk powder & cassava chips	26	38.1	46.2	53.8	58.6	62.6	66.1

- (a) Which two foods within the first two weeks led to the greatest increase in weight to occur? (1 mark)
- (b) (i) Which of the five gave the lowest growth rate? (1 mark)
- (ii) Account for your answer in b (i) above. (2 marks)
- (c) Between weeks 6 and 7 the average increase in weight was low in rats. Explain this observation. (2 marks)

(d) Suggest how the change in average weight in rats would have been at week 10 if the experiment was continued. (2 marks)

(e) Why were ten rats used in group instead of one rat? (2 marks)

(f) What difference would you expect between the data one would obtain if the rats were kept at 10°C? (2 marks)

(g) (i) Describe how the average weights of rats were determined in this experiment. (3 marks)

(ii) Give the formula for calculating the growth rates in rats. (1 mark)

(h) Apart from nutrition, state other factors that affect growth rate in rats. (4 marks)

7. Discuss comparative anatomy as an evidence of evolution. (20 marks)

8. Explain how finned fish like tilapia is adapted for swimming. (20 marks)