

P530/2
BIOLOGY PAPER 2
S.5 BIOLOGY HOLIDAY WORK
INSTRUCTIONS

Answer all questions.

Section A (Compulsory)

1. Two groups of maize seeds were germinated and grown in different culture solutions. Group A were provided with a complete nutrient solution while Group B were provided with a solution lacking Magnesium. An extract of photosynthetic pigments was made from leaves of each group of seedlings at the end of three weeks. Figure 1 is the absorption spectra obtained from the extracts

In another experiment, shoots of pondweed were placed in a test tube of pond water in which a dilute solution of sodium hydrogen carbonate had been added. The test tube was then exposed to filtered light from a 40-watt bulb, placed 40cm from the test tube. The relationship between the colour of light and the rate at which the bubbles were released was shown by the figure 2 below

Use the information to answer the questions that follow:

- (a) Compare the light absorption by extract from Group A and from Group B across the light spectrum (08marks)
- (b) Explain the light absorption across the light spectrum for each extract. (09marks)
- (c) How does a coloured filter affect light passing through it? (01 mark)
- (d) (i) State the relationship between the graph in figure 1 and the graph in figure 2. (02marks)
- (ii) Explain the relationship between the two graphs (04 marks)
- (e) State what would be observed if the distance between the bulb and the test tube was gradually reduced. Explain your answer. (04 marks)
- (g) Explain why
- (i) A dilute solution of sodium hydrogen carbonate was added to pond water in the test tubes. (02marks)

(ii) Measuring the rate of photosynthesis by counting bubbles is not an accurate method (02 marks)

(h) Using your knowledge about photosynthesis, explain four ways farmers in the tropics can use to improve their crop yields (08 marks)

2. (a) Describe the formation and synthesis of

(i) Polynucleotide (05 marks)

(ii) Polypeptide (10 marks)

(b) Suggest evidences that DNA is a hereditary material (05 marks)

3. (a) What is meant by the term ecosystem? (02 marks)

(b) Give an account of the biotic components of an ecosystem (06 marks)

(c) Explain how the following factors affect the abundance and distribution of organisms in an ecosystem

(i) Temperature (05 marks)

(ii) Water (04 marks)

(iii) Altitude (03 marks)

4.. (a) Briefly describe the structure of the nucleus in an eukaryotic cell (04 marks)

(b) Explain the changes in the water relations of a plasmolysed plant cell when inserted in a hypotonic solution. (12 marks)

(c) Why must transport occur across the cell surface membrane? (04 marks)

END