NAME.....

INDEX NO.....SIGNATURE.....

P530/2

BIOLOGY(THEORY)

PAPER 2

JUNE\JULY 2023

2 ½ HRS

AFRICANA MUSLIM SECONDARY SCHOOL

Uganda Advanced Certificate of Education

SENIOR 5 MID TERM TWO EXAMS

BIOLOGY (THEORY)

PAPER 2

2 HOURS 30MINUTES

INSTRUCTIONS TO CANDIDATES

- *This paper consists of **SIX** questions.*
- *Answer questions **ONE** in Section **A** plus **three** others from section **B**.*
- *Candidates are advised to read the questions carefully, organise their answers and present them precisely and logically, illustrating with well labelled diagrams.*
- *Your answers should be precise and concise*

SECTION A (40 MARKS)

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 the photosynthetic pigments was made from the leaves of each group of seedlings at the end of 3 weeks. Figure one shows the absorption spectra obtained from the extracts.

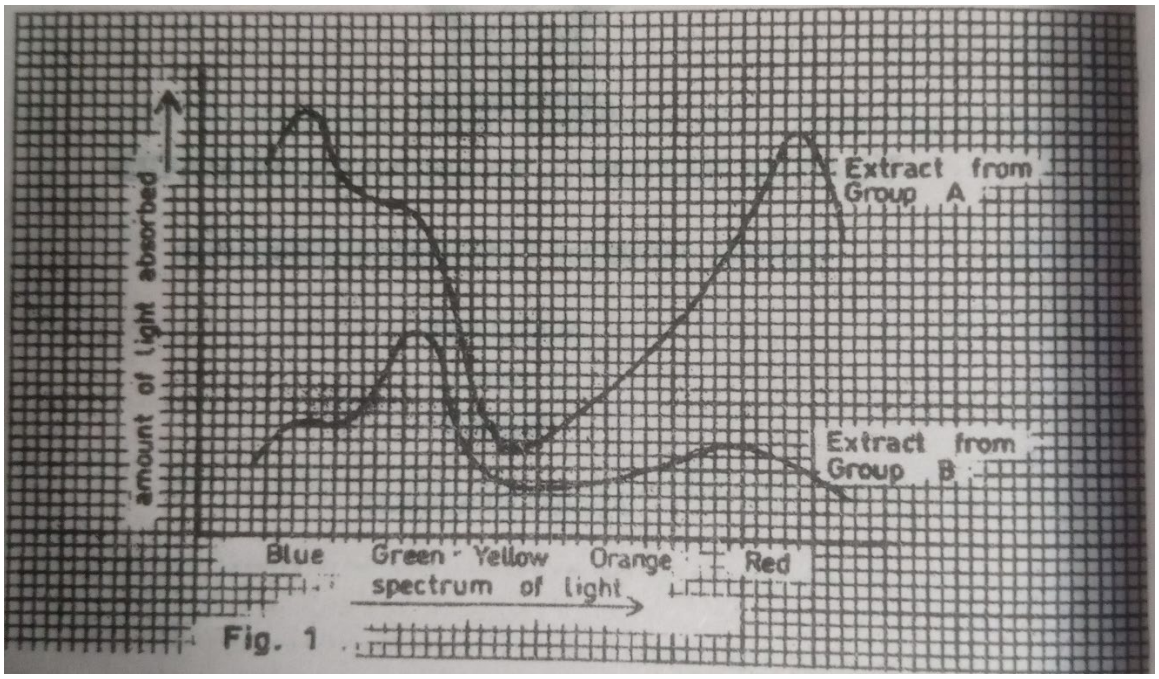

Fig. 1

In another experiment, six identical shoots of pond weed were placed in separate test tubes of pond water in which a dilute solution of sodium hydrogen carbonate had been added. Each test tube was exposed to light which had been passed through a different colored filter. The light in all cases was from a

40-watt bulb placed 40cm away from the test tube. The time taken for 20 bubbles to leave the cut end of each shoot was recorded three times and the average results are shown below.

Colour of the filter	Average time taken to release 20 bubbles in seconds	Number of bubbles released per minute
Violet	58	
Blue	40	
Blue-green	62	
Green	132	
Yellow	96	
Orange-red	70	

Use the information to answer the questions that follow:

a) Compare the light absorption by extract from group A and that 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 (01mark)
d) (i) Copy and complete the table by calculating the number of bubbles released by each shoot per minute (03marks)

(ii) Plot a graph to show the relationship between the Colour of a filter and the rate at which bubbles are released per minute. (06marks)

e) (i) compare you graph with that of figure 1 and state the relationship between the two (2marks)
(ii)What conclusions do you draw from the relationship (2marks)

f) State what would be observed if the distance between the bulb and the test tube was gradually reduced. Explain your answer. (4 marks)

g) Explain why;
   i) The type of the bulb and the distance of the bulb from the test tubes was kept constant (1mark)
   ii) A dilute solution of sodium hydrogen carbonate was added to the pond water in the test tubes (1mark)
   iii) There were three measurements made on each shoot rather than a single one (1mark)
   iv) Measuring the rate of photosynthesis by counting the number of bubbles is not an accurate method (1 mark)

SECTION B (60marks)

2. (a) What is meant by the term ***alternation of generations*** (5 marks)
(b) Describe the process of alternation of generations in a named Pteridophyte (10marks)
(c) what is the importance of alternation of generations to the life of a moss and a fern (05marks)
(UNEB 2010)

3. (a) Describe the structure of the plasma membrane according to the available theories (12marks)
(b)Explain how exocytosis and endocytosis occur across the plasma membrane (04marks)
(c)Explain the role of proteins with the plasma membranes (04marks) (UNEB 2011

4. (a) Give an outline of the classification of muscular tissues (1 ½ marks)
(b) Describe the structure of the phloem and the cardiac tissues (4 ½ marks)
(c) Explain how the structures of the phloem and cardiac muscles are related to their functions (14marks) (UNEB 2008)

5. (a) What is meant by a food chain (02marks)
(b) Explain how energy flows through the ecosystem (08marks)
(c) How does temperature influence the distribution of organisms (10 marks) (UNEB 2015)

6. (a) What is meant by the term ***photophosphorylation*** (03marks)
(b) Explain the role of water in photosynthesis (04marks)
(c) Briefly describe;
   i) The Non-Cyclic flow of electrons in the chloroplasts during the light reactions (04marks)
   ii) The synthesis of starch in the dark reactions of photosynthesis (07marks)

(d) Explain the principle of limiting factors in photosynthesis (02marks)

If you think too much about something, you end up only thinking about it

Time and tides wait for no man