P530/2

BIOLOGY

S.5 PAPER 2

2½ hours

Apr 2023

RENA COLLEGE MAYUGE

Uganda Advanced Certificate of Education

S. 5 BIOLOGY - 2023

HOLIDAY PACKAGE

PAPER 2

TERM ONE

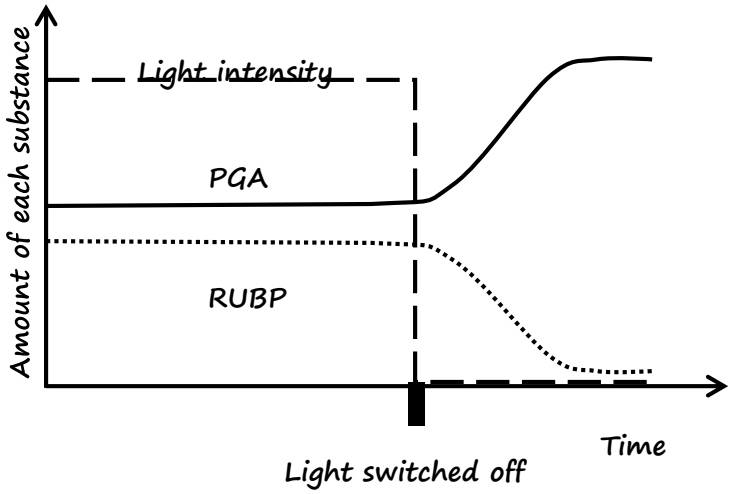
INSTRUCTIONS TO CANDIDATES:

- ✓ Answer question ALL question in this paper.
- ✓ Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labeled diagrams where ever necessary.

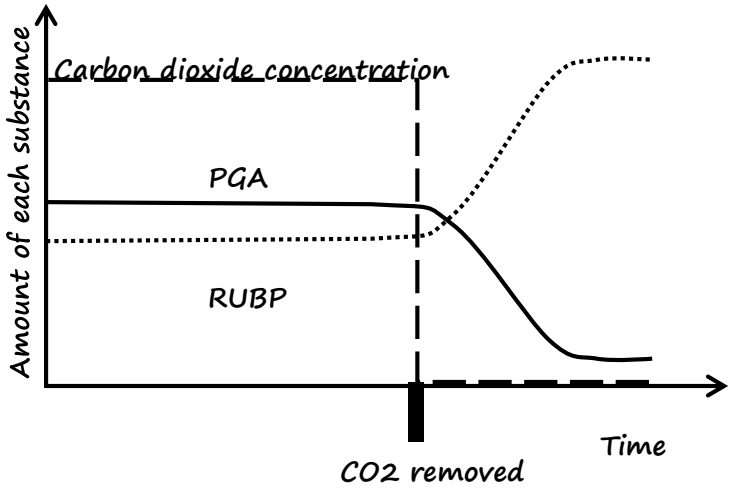
SECTION A: (40 Marks) Compulsory.

1. Experiments were carried out on cultures of a unicellular green protist to investigate the effect in the formation of phosphoglyceric acid (PGA) and ribulose bisphosphate (RUBP) of (A) switching the light off, i.e. suddenly putting the organisms in darkness, and (B) depriving the organisms of carbon dioxide. The results are summarized in the figures below.

A



B



a) Describe the effect of switching off light and removing carbon dioxide on the quantity of substances formed with time in Graph A and B respectively. **(06marks)**

b) Suggest explanations for the variation in the amount of PGA and RUBP in;

i. Graph A. **(09marks)** ii. Graph B. **(05marks)**

c) Sucrose is one of the substances observed to be formed during the investigation.

i. Sketch a graph to show the effect of switching off light on the amount of sucrose formed. **(03marks)** ii. Account for the shape of the graph in (i) above. **(06marks)**

d) Predict the levels of PGA and RUBP if experiments were continued for longer.

(03marks)

e) Explain the following observations.

i. Although photosynthesis generates ATP, plants also generate ATP by respiration. **(02marks)** ii. At high temperatures, the photosynthetic rate in higher in C4 plants than in C3 plants. **(03marks)** iii. Photosynthetic rate in C4 is not enhanced by atmospheric carbon dioxide, yet in C3 plants it is. **(03marks)**

SECTION B

2. (a) Describe the process involving absorption of carbohydrate products of digestion in the human gut. **(08marks)** (b) Relate the above process to the maintenance of osmotic properties of cells within the human gut. . **(08marks)** (c) How does influx of potassium cyanide alter the rate of absorption of products in (a) above? **(06marks)**
3. (a) Distinguish starch from cellulose. **(06marks)**
   a. Explain why lipids;

   (*i*) Are better energy storage compounds in animals than carbohydrates? **(06marks)**

   (*ii*) Have a higher calorific value than carbohydrates? **(06marks)**
4. (a) Describe the structure of a plant cell wall. **(12marks)** (b) Compare the structure of the plant cell wall and that of the plasma membrane.

(08marks)

END