P530/2

BIOLOGY

(Theory)

Paper 2

July 2022

2½ Hours

UGANDA MUSLIMS TEACHERS' ASSOCIATION

UMTA JOINT MOCK EXAMINATIONS -2022

UGANDA ADVANCED CERTIFICATE OF EDUCATION

BIOLOGY

(THEORY)

Paper 2

2 hours 30 minutes.

INSTRUCTIONS TO CANDIDATES:

This paper consists of six questions.

Answer question **one** in **section A** plus **three** others from **section B**.

Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically with well labelled diagrams where necessary.

Candidates are also advised to write on the front page of the answer sheets used, their full name, index number and indicate the questions attempted in the their orders in a table as shown below,

Question					TOTAL (%)
Marks					

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SECTION A (40 MARKS)

1. An experiment was conducted to investigate the uptake of nitrogen and the amount of nitrogen incorporated into organic compounds in groups of soya beans that belong to the family Papilionaceae (legumes). These plants possess root nodules containing Rhizobium bacteria.

In this investigation, different groups of the soya bean seedlings were grown under green houses (Glass houses).

The first group of the soya bean seedlings were grown in a glass house enriched with carbon dioxide.

The second group of the soya bean seedlings (control plants) were grown in glass house in a normal atmosphere of carbon dioxide.

After 25 days, the total amount of nitrogen incorporated into compounds in these plants were measured at intervals of time until the plants were 100 days old.

The results of the experiment is shown in the figure 1 below. Study it and answer the questions.

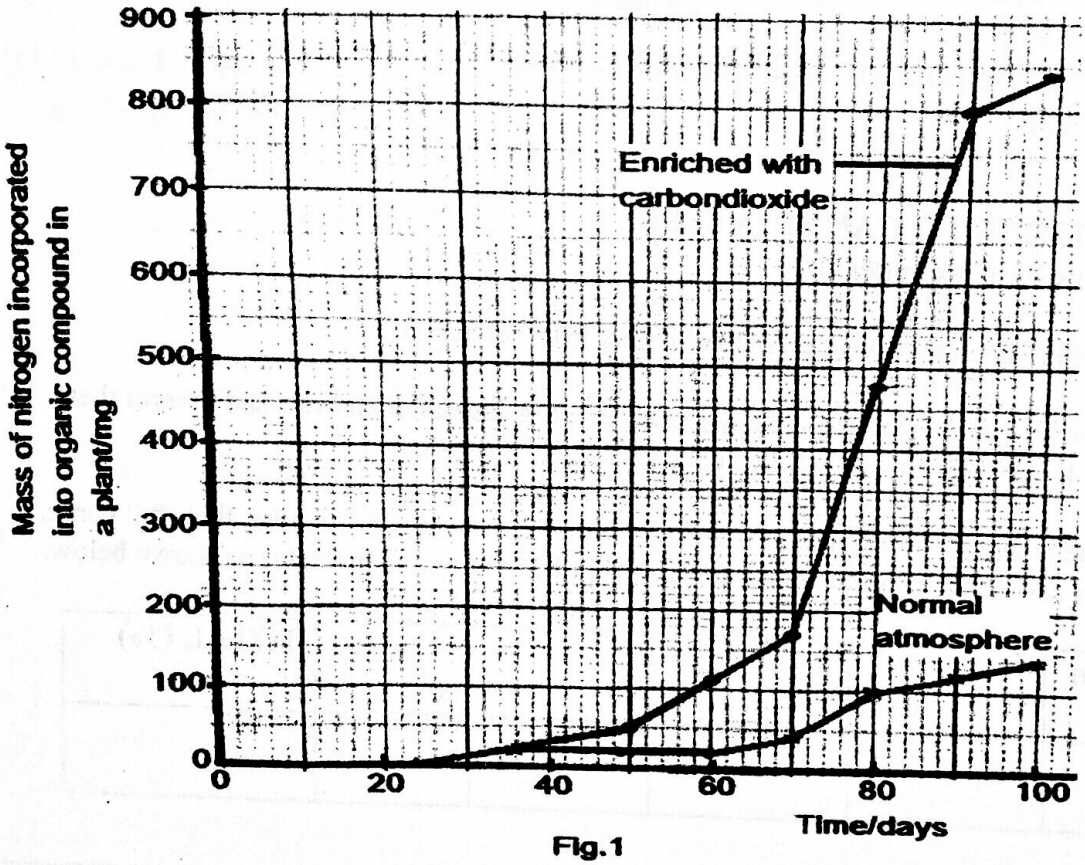

Fig.1

(a) Compare the mass of nitrogen incorporated into compounds in the first and second groups of the soya bean seedlings. (09 marks)

(b) Explain,

(i) The trend of the mass of nitrogen incorporated into organic compounds in the first group of the soya bean seedlings beyond 70 days. (07 marks)

(ii) The difference in the mass of nitrogen incorporated into organic compounds in the first and second group of soya bean seedlings. (10 marks)

(c) Briefly describe how cells of the soya bean plants can obtain nitrogen that are incorporated into the organic compounds, from the,

(i) Soil. (04 marks)

(ii) Atmosphere. (03 marks)

(d) Suggest why, it was necessary to,

(i) Grow the soya bean seedlings in green houses. (03 marks)

(ii) Conduct the investigation with the second group of soya bean seedlings. (02 marks)

(e) In what ways are activities in a green houses (Glass houses) similar to the global green house effect. (03 marks)

SECTION B (60 MARKS)

2. (a) State the significance of excretion in mammals. (04 marks)
   (b) Describe physiological differences that exist in osmo-regulation between fresh water fish and marine bony fish. (07 marks)
   (c) Account for the production of small quantities of hypertonic urine in mammals. (09 marks)

3. (a) Describe the roles played by different organelles in synthesis of glycol-proteins in the cell of living organisms. (09 marks)

   (b) Discuss about the cell membrane, the existence of each of the following, its
   (i) Fluid mosaic nature. (07 marks)
   (ii) Bilayer. (04 marks)

4. (a) Give physiological events which will occur in menstrual cycle when fertilization does not succeed. (06 marks)

   (b) Discuss series of processes that occur in menstrual cycle leading into the development of,
   (i) Graafian follicle. (06 marks)
   (ii) Corpus luteum. (08 marks)

5. (a) Compare directional and disruptive selections. (08 marks)
   (b) Explain ,
   (i) How comparative biochemistry provides evidence that support organic evolution. (06 marks)
   (ii) The effect of base deletion mutation on the overall nature of protein molecules synthesized. (06 marks)

6. (a) How does structural arrangements of tissues in higher plants permit transport of materials. (08 marks)
   (b) Explain how each of the following play roles in transport of water in plants,
   (i) Particular plant tissues. (08 marks)
   (ii) Environmental temperatures. (04 marks)

END