P530/2
BIOLOGY
(Theory)
Paper 2
July/Aug.2023
$2^1/_2$ hours

KAYUNGA SECONDARY SCHOOLS HEAD TEACHERS AND PRINCIPAL ASSOCIATION (KASSHPA)

Uganda Advanced Certificate of Education

BIOLOGY

(THEORY)

Paper 2

2 hours: 30 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **six** questions.*

*Answer **one** question 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 where necessary

SECTION A (40 MARKS)

1. In an investigation, the blood glucose levels of a health adult human being were measured after eating a complex carbohydrate. The experiment was repeated on another day with the same human being fed on a protein meal and on the third day when the same person ate a fat rich meal. Figure **1** shows the results of the investigation

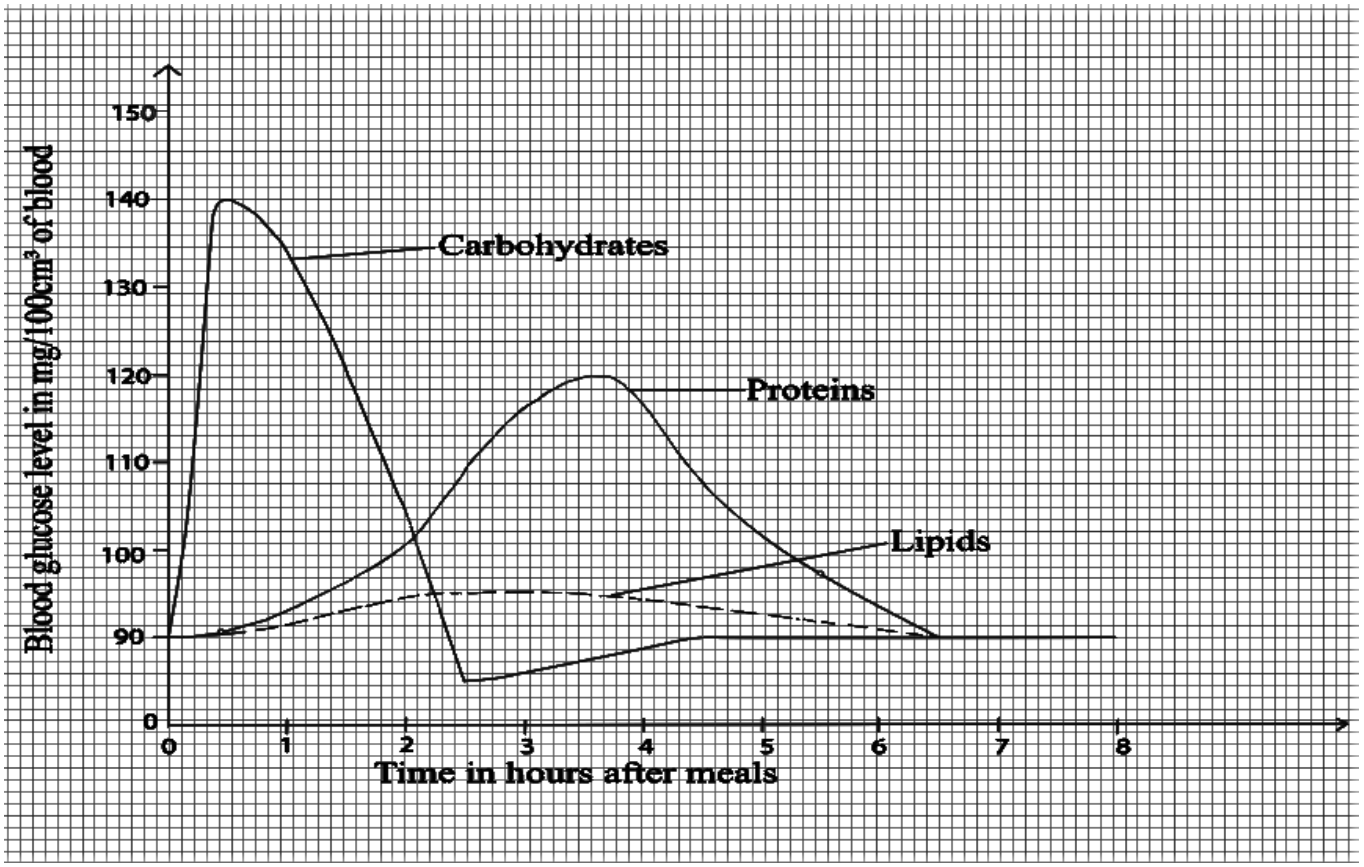

Fig.1

(a) Compare the effects of a carbohydrate meal and protein meal on the blood glucose levels of the individual. *(06 marks)*

(b) Explain the changes in the blood glucose levels of the individual following the intake of a

(i) Carbohydrate meal. *(10 marks)*

(ii) Lipid meal. *(04 marks)*

(c) Explain the differences in the effect of the carbohydrate meal and protein meal on the blood glucose levels. (*06 marks)*

(d) Suggest how the results of a carbohydrate meal would differ if a healthy person was replaced with a diabetic one. Give an explanation for your answer.
(05 marks)

(e) Explain why each of the following were done during the investigation.

(i) Same person was given different types of meals. (*02 marks)*

(ii) Each meal was given on a separate day. (*02 marks)*

(f) Explain the physiological significance of the results of this experiment.
(*05 marks)*

SECTION B (60 MARKS)

2. (a) How does each of the following affect a natural population.

(i) Resource partitioning. (*06 marks)*

(ii) Occurrence of polyploidy in plants. (*06 marks)*

(b) Explain the ways in which humans may promote the evolutionary success of a population. *(08 marks)*

3. (a) Describe the structural features of the meristematic tissues and a xylem vessel element. (*06 marks)*

(b) How is the xylem vessel element formed from its meristematic cell?
(09 marks)

(c) How does the distribution of xylem tissue contribute to mechanical support in plants? *(05 marks)*

4. (a) Giving examples, describe the physiological adaptations of mammals to living in dry habitats. (*16 marks)*

(b) Explain why plants that live in high altitude areas exhibit xeromorphic features (*04 marks)*

5. (a) How does temperature influence plants growth? (*10 marks)*

(b) Explain the ecological importance of each of the following processes in plants.

(i) Phototropism. (*06 marks)*

(ii) Apical dominance. *(04 marks)*

6. (a) Describe the initiation and control of the heartbeat. *(12 marks)*

(b) Explain how some mammals are able to survive during deep sea diving. (*08 marks)*