P530/2

Biology
Paper 2
July/Aug, 2023
2 1/2 Hours

UNNASE Community

# UNNASE MOCK EXAMINATIONS

## UGANDA ADVANCED CERTIFICATE OF EDUCATION RESOURCEFUL EXAMINATIONS

## BIOLOGY PAPER 2

## (THEORY)

## TIME: 2 HOURS 30 MINUTES

**Instruction to candidates**

- This paper consists of section A and B;
- Answer question one in section A plus any three from section B.
- Candidates are advised to read the questions carefully, organised their answers and present them precisely and logically, illustrating with well labelled diagrams wherever necessary.

| Question | Marks |
|---|---|
| | |
| | |
| | |
| | |
| Total | |

## SECTION A: (40 MARKS)

***Compulsory question***

1. Figure 1 shows the changes that occur in the concentration of insulin and glucose in the blood stream of a person who had fasted overnight and then swallowed 75g of glucose.

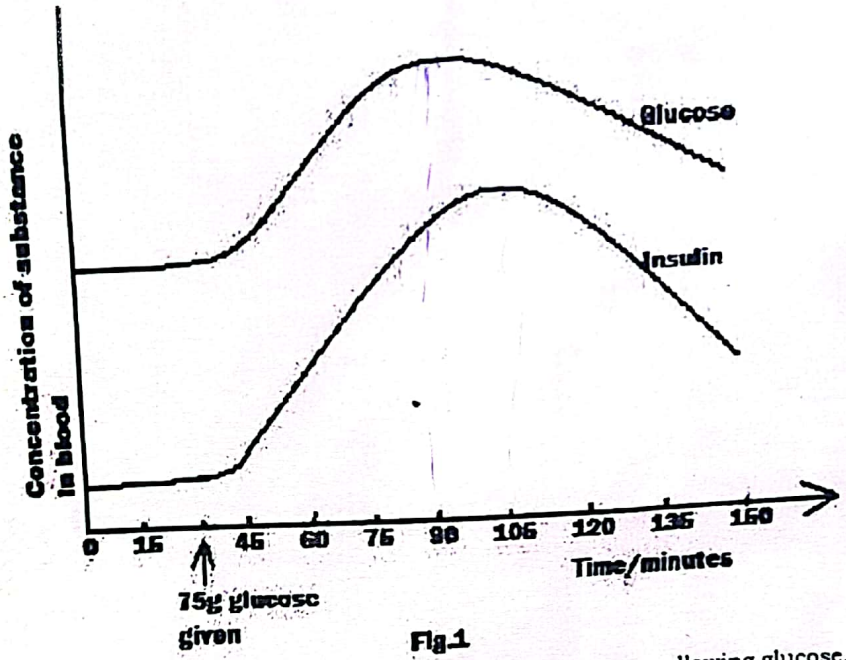


Fig 1

(a) Compare the levels of glucose and insulin after swallowing glucose. (06 marks)

(b) Explain the changes in the concentration of; (04 marks)
(i) Glucose. (06 marks)
(ii) Insulin.

(c) Explain how the concentration of insulin would change if the person engaged in an exercise. (03 marks)

(d) Figure 2 shows the changes in the amount of liver glycogen and glucagon concentration in blood of a person during prolonged exercise.

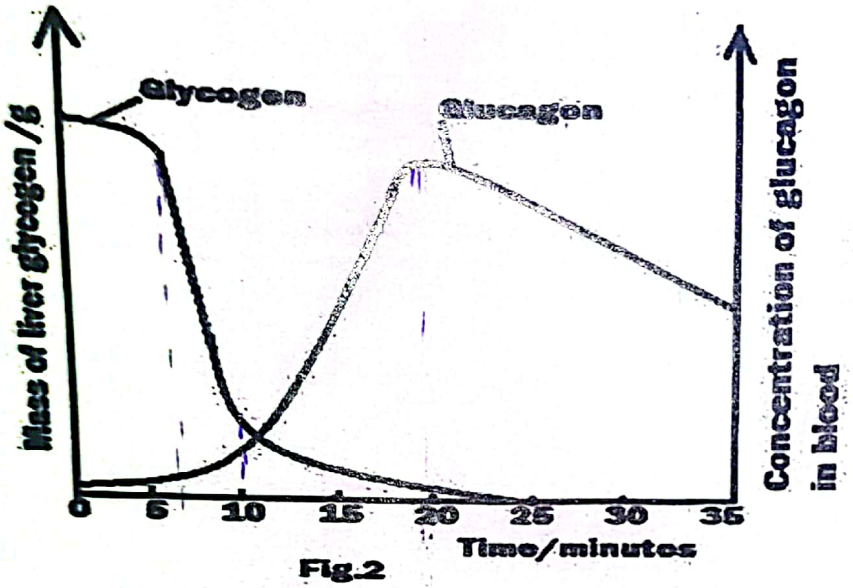


Fig.2

(i) Describe the effects of prolonged exercise on the amount of glycogen and the concentration of glucagon in blood. (04 marks)

(ii) Explain the trend in the mass of glycogen and glucagon in blood. (12 marks)

(e) Suggest how continuous supply of glucose is ensured after the 25th minute. (05 marks)

**SECTION B: (60 MARKS)**

***Attempt any three questions***

2. (a) What is meant by the term **eutrophication?** (02 marks)

(b) Explain the causes of **eutrophication.** (06 marks)

(c) Explain the;

(i) Adaptations of water hyacinth for its survival as a successful weed. (06 marks)

(ii) Ecological effects of water hyacinth on water. (06 marks)

3. (a) Compare polyploidy and aneuploidy. (06 marks)

(b) Give the conditions for emergence of polyploids in plants. (04 marks)

(c) Explain the following;

(i) Failure to develop an effective vaccine against plasmodia species which causes malaria. (05 marks)

(ii) How man influences the process of **speciation**. (05 marks)

4. (a) Describe how a carbon dioxide molecule in the mesophyll cells of a C3 plant can be converted into a triglyceride. (09 marks)

(b) Explain the **physiological** and **ecological** advantages C4 plants have over C3 plants. (06 marks)

(c) Explain the **physiological significance** of chloroplast. (05 marks)

5. (a) Describe the role of the **aortic** and **carotid bodies** in the control of the respiratory rate in man. (06 marks)

(b) Describe how the respiratory rate in a cell is controlled. (07 marks)

(c) Distinguish between **Kreb's cycle** and **glycolysis**. (04 marks)

(d) Explain why ATP is a suitable energy store in cells. (03 marks)

6. (a) Describe the **physiological significance** of monosaccharides. (06 marks)

(b) Describe the structure of the following polysaccharides;

(i) Starch. (06 marks)

(ii) Cellulose (04 marks)

(c) Explain why carbohydrates are able to form a variety of carbohydrates. (04 marks)

**END/AB 2023**