P530/3
BIOLOGY
Paper 3
SEPTEMBER, 2023
2.5 Hours

ST. JULIAN HIGH SCHOOL SEETA CAMPUS

Uganda Advanced Certificate of Education

Paper 2

2 Hours 30 Minutes

Instructions to candidates:

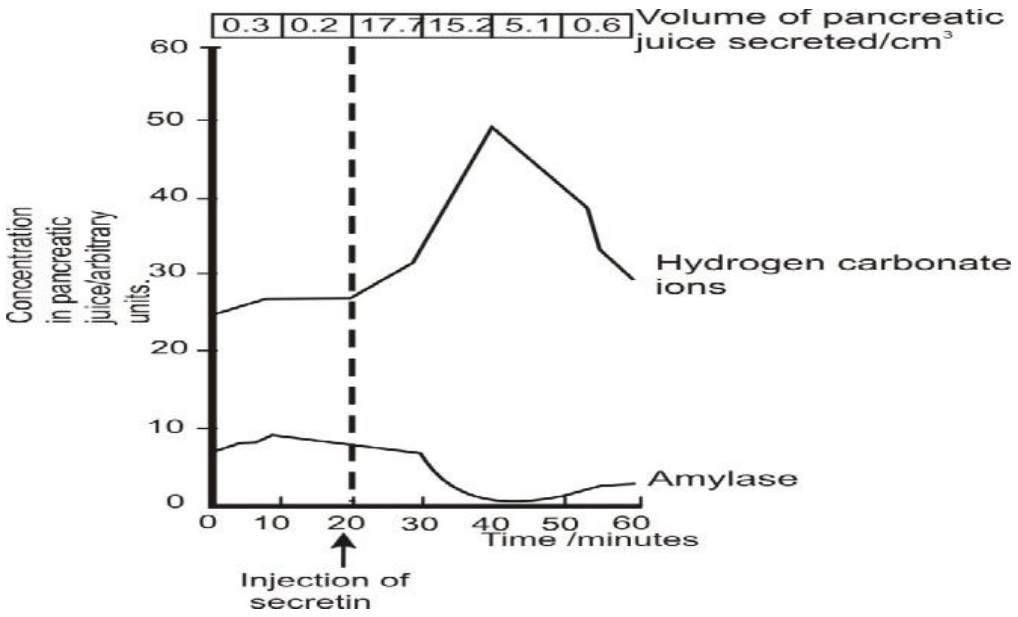
This paper consists of Sections **A** and **B**

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, illustrating with well labeled diagrams wherever necessary.

SECTION A (40 MARKS)

1. The graph shows how an injection of secretin affects the secretion of pancreatic juice by the pancreas.



a) (i) Use the graph to describe the effect of secretin on the pancreas. (4 marks)

ii) Explain why the concentration of amylase in the pancreatic juice decreased shortly after the injection of secretin. (3 marks)

b) What other digestive secretion is stimulated by secretin. (2 marks)

c) Certain types of ulcers are thought of to be made worse by the production of too much acid from the stomach. Doctors have used a number of different methods to treat these ulcers. Suggest how the following treatments might reduce the amount of acid secreted by the stomach.

i) Cutting the vagus nerve to the stomach. (6 marks)

ii) Giving the patient atropine, which blocks the action of acetylcholine (6 marks)

d) Giving examples, explain how organisms are able to utilize cellulose in their diet. (10 marks)

e) In what ways are saprophytes important to man? (9 marks)

SECTION B (60 MARKS)

2. a) Define the term fecundity. (01 mark)

   b) Describe how each of the following affect a natural population.

   i) Diseases (03 marks) ii) Predation (03 marks)

   c) Giving examples, explain the various ways in which variation may arise. (07 marks)

   d) What is the role of natural selection in the evolution of organisms? (06 marks)

3. a) What is meant by oxidative decarboxylation? (04 marks)

   b) Explain the chemiosmotic theory of energy formation. (07 marks)

   c) Describe the respiratory metabolism of glycerol in the cytoplasm of the cell. (09 marks)

4. (a) Explain the three types of neurons (03 marks)

   (b) Describe how an action potential is formed in a neuron (08 marks)

   (c) Explain the properties of a nerve impulse (4 marks)

5. a) What are the adaptations of the plasmodia to its parasitic mode of life (03 marks)

   b) Describe the life cycle of plasmodia. (11 marks)

   c) Why is malaria still such an unrelenting disease in sub-Saharan Africa? (06 marks)

6. a) Describe how the ventilation mechanism are achieved in man (05 marks)

   b) What are the adaptations of an efficient respiratory surface (10 marks)

   c) What is counter current exchange system (05 marks)

End