

P530 | 2
BIOLOGY (THEORY)
Paper 2
July/Aug 2019
2½ Hours.



WESTERN JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

BIOLOGY (THEORY)

Paper 2

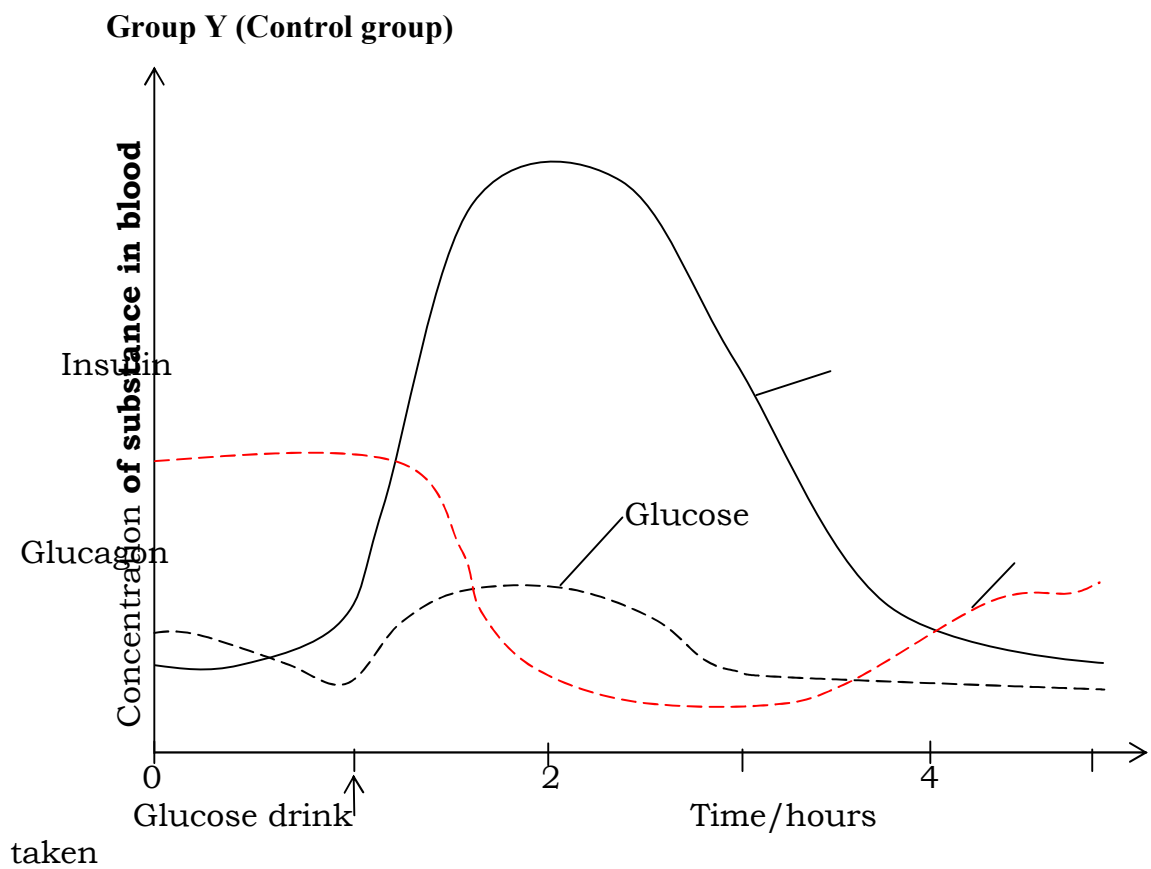
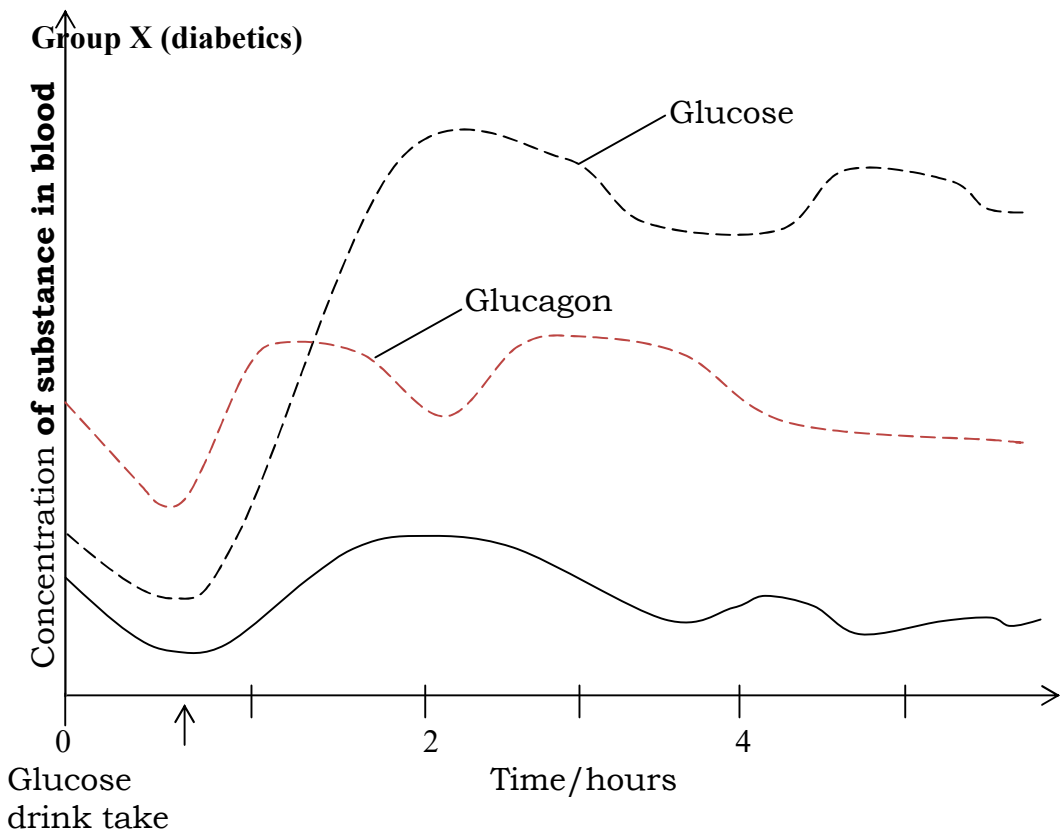
2 hours 30 minutes.

INSTRUCTIONS TO CANDIDATES:

- Answer question **ONE** in section **A**, Plus **THREE** other questions in section **B**
- **All** answers should be written on the answer sheets provided.

SECTION A(40 MARKS)

1. An experiment was carried out with two groups of people. Group **X** had type 1 diabetes while group **Y** did not (control group). Every 15 minutes blood samples were taken from all members of both groups and the mean levels of insulin, glucagon and glucose were calculated. After an hour every person was given a glucose drink. The results are shown in the figure below:



- (a) (i) Compare the levels of blood glucose between the two groups of people. (07 marks)
- (ii) Give an explanation for the observed pattern of the levels of blood glucose in the two groups of people. (07 marks)
- (b) Explain the differences between groups X and Y in the way insulin secretion responds to the drinking of glucose. (05 marks)
- (c) Explain the changes in the levels of glucagon in the two groups of people after ingesting glucose. (05 marks)
- (d) Suggest what might happen to the blood glucose concentration of group X if they had no food in take over the next 24 hours.(02 marks)
- (e) What is the significance of the physiological process illustrated in the graphs above? (04 marks)
- (f) Name a hormone other than insulin and glucagon that is involved in regulating blood glucose levels. (01 mark)
- (g) Suggest reasons why hormonal rather than nervous stimuli are used to control the level of glucose in the blood. (04 marks)
- (h) Describe how a constant level of blood glucose is maintained. (05 marks)

SECTION B(60 MARKS)

2. (a)(i) Describe the features of the placenta that facilitate the exchange of materials. (06 marks)
- (ii) Discuss the endocrine functions of the placenta in mammals.(04 marks)
- (b) Describe how the following processes are initiated and controlled in a mammal.
 - (i) Ovulation (04 marks)
 - (ii) Menstruation (06 marks)
3. (a) Describe how membrane structure is related to the transport of materials across a membrane(14 marks)
- (b) Describe the role of membranes in the synthesis of ATP in respiration (06 marks)
4. (a) How are the following tissues adapted to their functions?
 - (i) Phloem (05 marks)
 - (ii) Xylem (05 marks)
- (b) Describe the mass flow of materials through the phloem(10 marks)
5. (a) Discuss the role played by blood in the defence of the body. (12 marks)
- (b) Describe the processes by which the body attains active immunity.(08 marks)
6. (a) Outline the different selection pressures that may limit a population of species. (05marks)
- (b) Discuss how each of the following types of selection acts on a population of species and in each case state the evolutionary significance of the type of selection. (15 marks)
 - (i) Stabilizing selection
 - (ii) Directional selection
 - (iii) Disruptive selection

END