

P530/2
BIOLOGY
Paper 2
July / August 2024
2½ hours



MASAKA DIOCESE EXAMINATION BOARD

Uganda Advanced Certificate of Education

JOINT MOCK EXAMINATIONS 2024

BIOLOGY

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

*Answer questions **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 labelled diagrams where necessary.

SECTION A: (40 Marks)

1. The glucose concentration in the blood plasma and the effects of two hormones X and Y on its levels were investigated both before and after a meal for a period of over 240 minutes. The results of the investigation are shown in figure 1 and 2 below. Use the figures to answer the questions below.

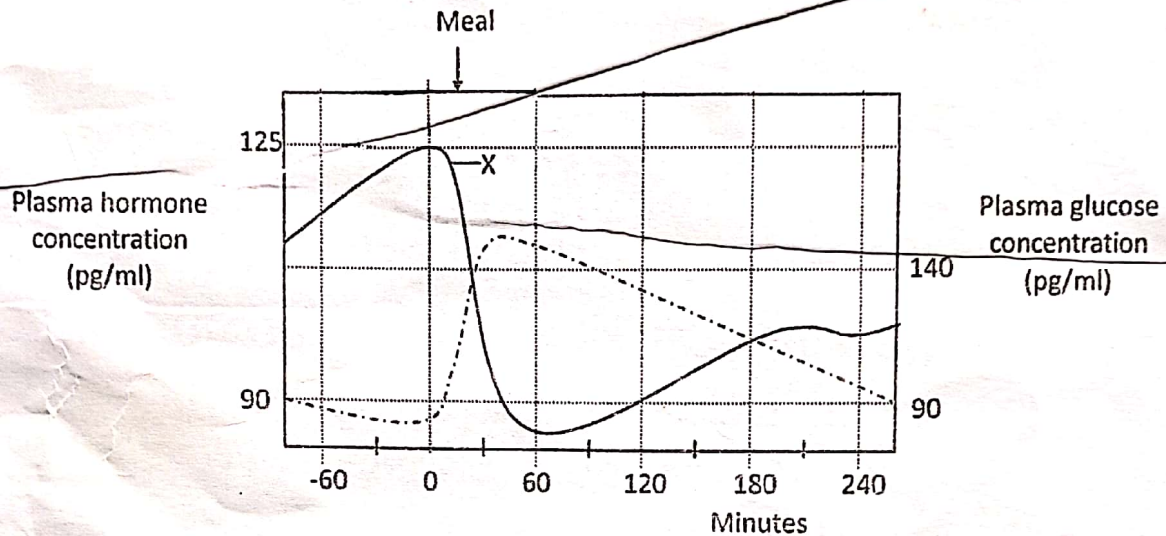


Figure 1

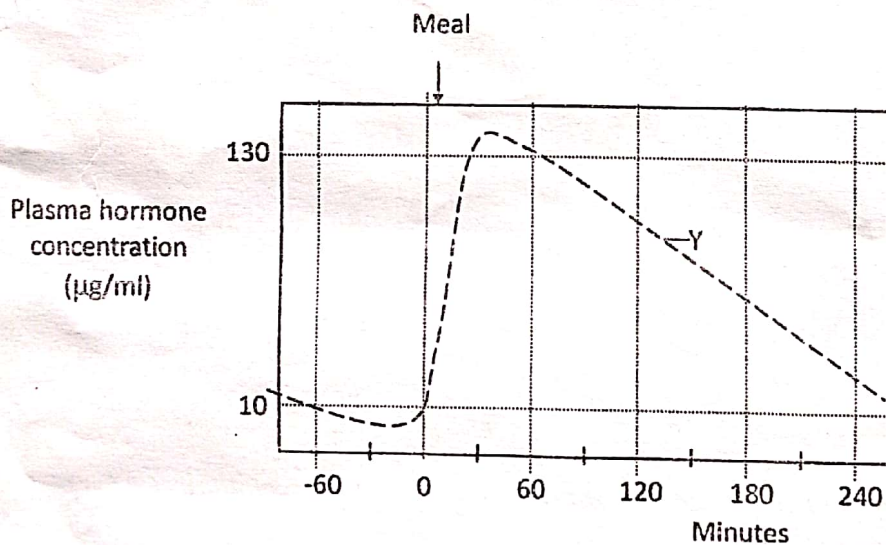


Figure 2

KEY

- Plasma glucose concentration
- Plasma hormone concentration X
- Plasma hormone concentration Y

- (a) Identify the hormones for the curves labelled X and Y. Give a reason in each case to support your answer. (04 marks)
- (b) i) Compare the levels of the hormones X and Y. (08 marks)
 ii) Explain the pattern of change of hormone X before the meal. (03 marks)
- (c) i) Explain the differences in concentration between hormone X and Y during the investigation. (06 marks)
 ii) Predict what would happen to the plasma concentration of hormone Y if the investigation is continued for some time. Explain your answer. (02 marks)
- (d) Describe the mode of action of hormone Y at the target cells. (04 marks)
- (e) i) How is the level of glucose in blood managed in case of the homeostatic breakdown? (07 marks)
 ii) Give other hormones apart from X and Y which influence plasma glucose concentrations, their sources and effects. (06 marks)

SECTION B : (60 Marks)

2. (a) Explain the significance of meiosis during gametogenesis. (05 marks)
 (b) How does the development of the embryo sac in flowering plants differ from oogenesis in human? (09 marks)
 (c) Explain the role of parental care among mammals. (06 marks)
3. (a) What are the major challenges faced by organisms during transition from aquatic to terrestrial habitat? (06 marks)
 (b) Outline the factors that have led to the huge success of plants in colonizing the terrestrial habitat. (14 marks)
4. (a) What are the functions of carotenoids in living organisms? (04 marks)
 (b) Respiration generates more ATP in plant than photosynthesis. Explain. (06 marks)
 (c) Explain how light energy is transformed into chemical energy for dark assimilation. (10 marks)
5. (a) Give an account of the evidence of evolution based on:-
 i) cell biology (04 marks)
 ii) Species distribution. (04 marks)
 iii) domestication and selection breeding. (04 marks)
 (b) Explain why there are more colour blind individuals than haemophiliacs in the human population despite the similar way of transmission. (08 marks)
6. (a) Differentiate between innate and learned behaviour. (05 marks)
 (b) Describe the importance of hormones in animal behaviour. (08 marks)
 (c) Explain the significance of courtship behaviour in a population. (07 marks)

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