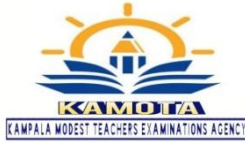


*P530/2
BIOLOGY
Paper 2
July/Aug 2023
2½ hours*



KAMOTA MOCK EXAMINATIONS 2023

UGANDA ADVANCED CERTIFICATE OF EDUCATION

Biology

(Theory)

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper consists of two sections **A** and **B**.*

*Answer question **one** in section **A** plus **three** others from section **B**.*

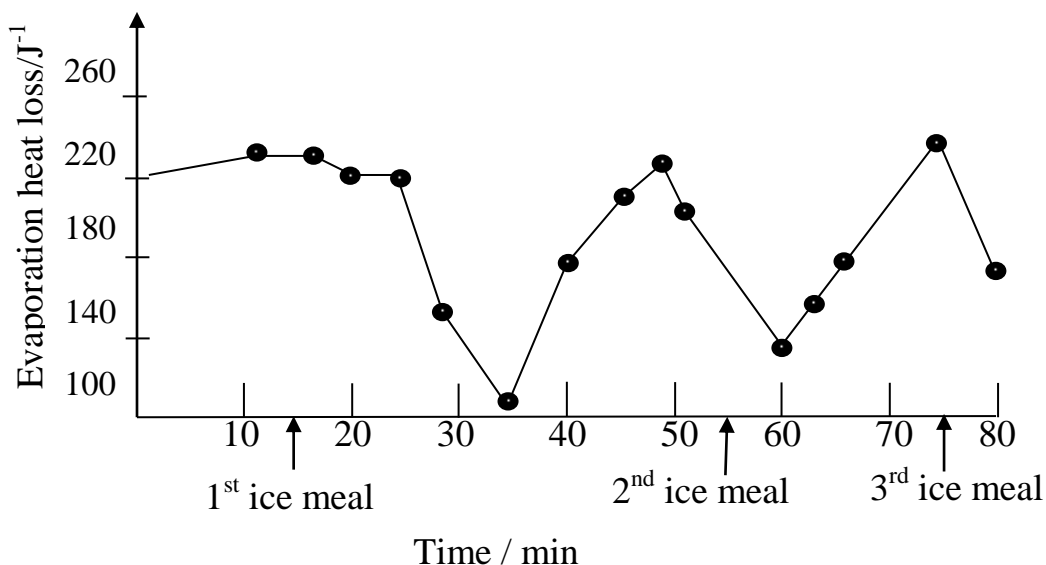
Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with labeled diagrams where necessary.

*Additional question(s) answered will **not** be marked.*

SECTION A: (40 MARKS)

1. A special calorimeter was developed into which a volunteer human being could be placed, so that measurements of the temperature of the skin surface and hypothalamus were made. The calorimeter temperature rose initially but stabilized within 15 minutes. After forty minutes into the calorimeter the person was given a quantity of iced water to drink which was repeated thirty minutes later.

The graph below shows the body energy loss due to sweating taken at 5 minutes interval.



The table below shows the temperature of the skin surface and that of the hypothalamus taken at the same time with heat loss after the initial cold drink.

Time after entering calorimeter (min)	Temperature ($^{\circ}\text{C}$)	
	Skin	Hypothalamus
40	36.5	37.5
45	37.1	37.2
50	37.5	36.9
55	37.3	37.2
60	37.1	37.4
65	37.0	37.5
70	36.9	37.4
75	37.3	37.1
80	37.2	37.2
85	37.1	37.4

- (a) Represent the above information on the graph paper. (08 marks)
- (b) Explain the relationship between;
- (i) Skin temperature and energy loss by evaporation. (08 marks)
- (ii) Temperature of hypothalamus and energy loss by evaporation. (08 marks)
- (c) Why;
- (i) A special calorimeter was used. (01 mark)
- (ii) Iced water was not given at the start of the experiment. (04 marks)
- (iii) The skin temperature rises shortly after ingestion of iced water. (04 marks)
- (d) State and explain what would happen in each if;
- (i) The inside of the calorimeter was kept at a constant temperature of 10°C. (05 marks)
- (ii) A lizard was used instead of a human being. (03 marks)
2. (a) Describe the different types of enzyme inhibition. (10 marks)
- (b) Explain the effect of temperature on enzyme activity. (07 marks)
- (c) Suggest the significance of inhibition. (03 marks)
3. (a) compare the structure of the photoreceptor cells of the mammalian eye. (07 marks)
- (b) Describe how the mammalian eye accommodates objects. (07 marks)
- (c) What is the significance of synapses in nervous transmission? (06 marks)
4. (a) What is osmoregulation? (03 marks)
- (b) How is the functioning of the kidney nephron controlled? (08 marks)
- (c) Explain how the counter-current heat exchange conserves heat energy? (09 marks)
5. (a) What is meant by the term photophosphorylation? (03 marks)

- (b) Describe the role of pigments and light in photosynthesis. *(10 marks)*
- (c) Explain the function of the primary tissues in plant roots. *(06 marks)*
- 6. (a) Give an outline of Darwin's theory of evolution. *(10 marks)*
- (b) Explain how each of the following supports Darwin's theory of evolution;
 - (i) Industrial melanism *(05 marks)*
 - (ii) Resistance to insecticides *(05 marks)*

END.