P530/2
BIOLOGY
(Theory)
PAPER 2
July/August 2019
2 1/2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

BIOLOGY

(Theory)

Paper 2

2 hours 30 minutes

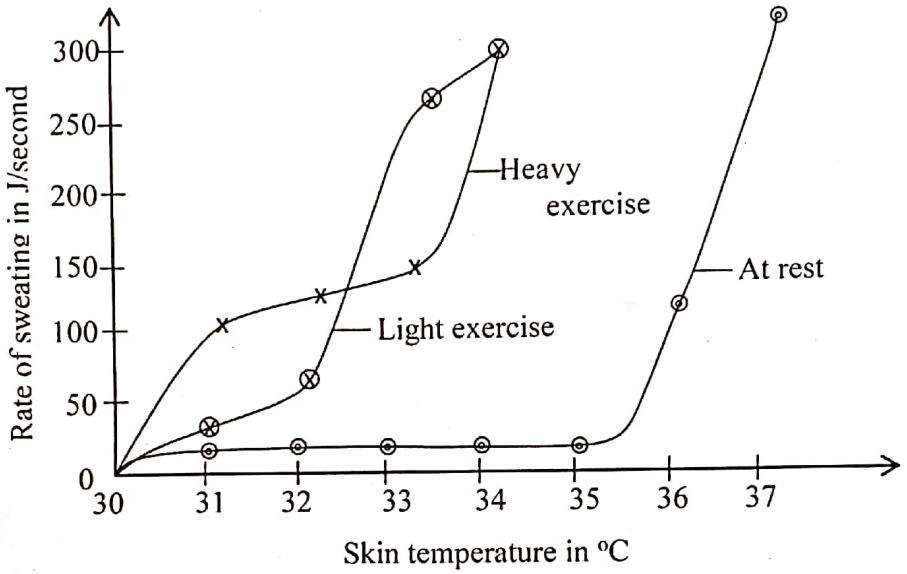
INSTRUCTIONS TO CANDIDATES:

- *This paper consists of sections,* **A** *and* **B**.
- *Answer question* **one** *in section* **A** *plus* **three** *other questions from section* **B.**
- *Any additional question(s) answered will* **not** *be marked.*
- *Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically.*
- *Illustrate with well labelled diagrams, wherever necessary.*

SECTION A (40 MARKS)

COMPULSORY QUESTION

1. (a) The graph below shows results obtained from an investigation to determine the effect of skin temperature on the rate of sweat production in a land mammal during rest, light exercise and heavy exercise. Study the data provided and answer the questions that follow;



i) Describe the effect of increasing skin temperature on the rate of sweating during light exercise. (03 marks)

ii) Compare the rate of sweat production of the mammal under light exercise and at rest. (06 marks)

iii) Explain why there is general increase in the rate of sweating under the conditions in the investigations? (04 marks)

(b) Account for the observed changes in the rate of sweat production during;

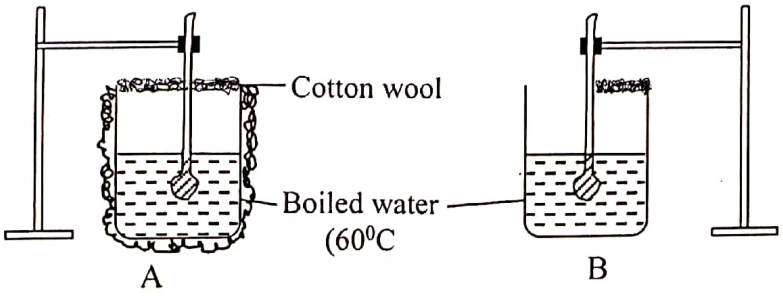
(i) Rest (03 marks)

(ii) Light exercise (05 marks)

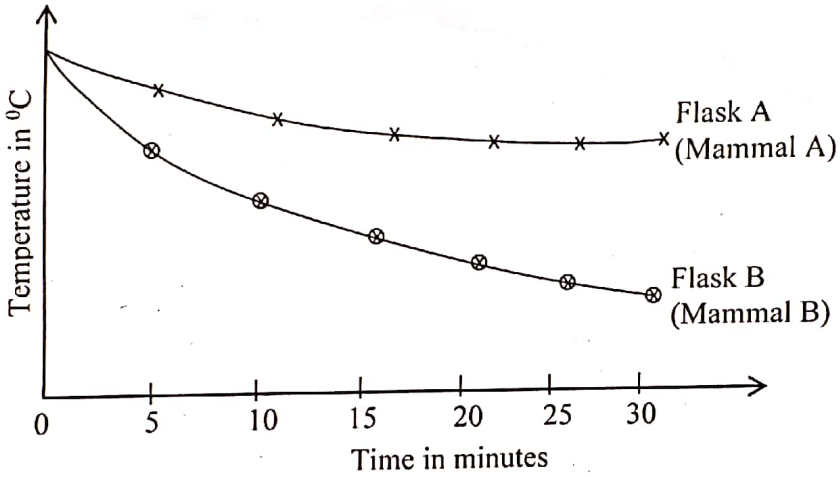
(iii) Heavy exercise (04 marks)

(c) Describe how increase in body temperature of the mammal results in increased sweat production. (05 marks)

(d) In an experiment to determine the effect of amount of fur on heat loss in two mammals, a Biologist used two flasks containing boiled water at 60°C labelled A and B representing the two animals. Flask A was completely covered with cotton wool while flask B was partially covered as illustrated below. Temperature recordings were taken at 5 minutes interval.



The results obtained were plotted in the figure below.



(i) Explain the observed differences in temperature recordings from the two flasks. (04 marks)

(ii) Suggest the habitats in which each of the represented mammals A and B lives. (02 marks)

(iii) Suggest the mechanisms other than those represented in flask A, that are employed to maintain body temperature in mammal A. (04 marks)

SECTION B (60 MARKS)

*Answer **three** questions from this section.*

2. (a) Describe the process of energy flow in an eco-system. (04 marks)

(b) i) Describe the factors that cause organisms to become endangered. (10 marks)

ii) Suggest reasons why large mammals are more prone to extinction than small mammals. (06 marks)

3. (a) Outline the properties of receptors. (05 marks)

(b) Explain the necessity for organisms to respond to changes in their environment. (03 marks)

(c) Describe the role played by the organ of corti in the mammalian ear. (12 marks)

4. (a) Explain the physiological adjustments in the human body during an exercise. (10 marks)

(b) Outline three features of the immune system. (03 marks)

(c) Describe how a human body responds to invasion by a pathogen. (07 marks)

5. (a) Describe the role of the following during protein synthesis.

i) tRNA (03 marks)

ii) mRNA (04 marks)

(b) Compare protein synthesis with DNA replication. (08 marks)

(c) Describe the characteristics of genetic code. (05 marks)

6. (a) How is the vascular tissue formed in plants? (10 marks)

(b) i) With examples of plant parts, describe the effects of auxin distribution caused by various unidirectional factors. (06 marks)

ii) Outline the roles of auxins in plants. (04 marks)

END