

P530/2  
BIOLOGY  
PAPER 2  
JUL./AUG. 2025  
2½ HOURS



## THE BIOLOGY SYNDICATE (TBS) MOCK 2024

Uganda Advanced Certificate of Education

BIOLOGY  
(THEORY)

**PAPER 2**

2HOURS 30 MINUTES

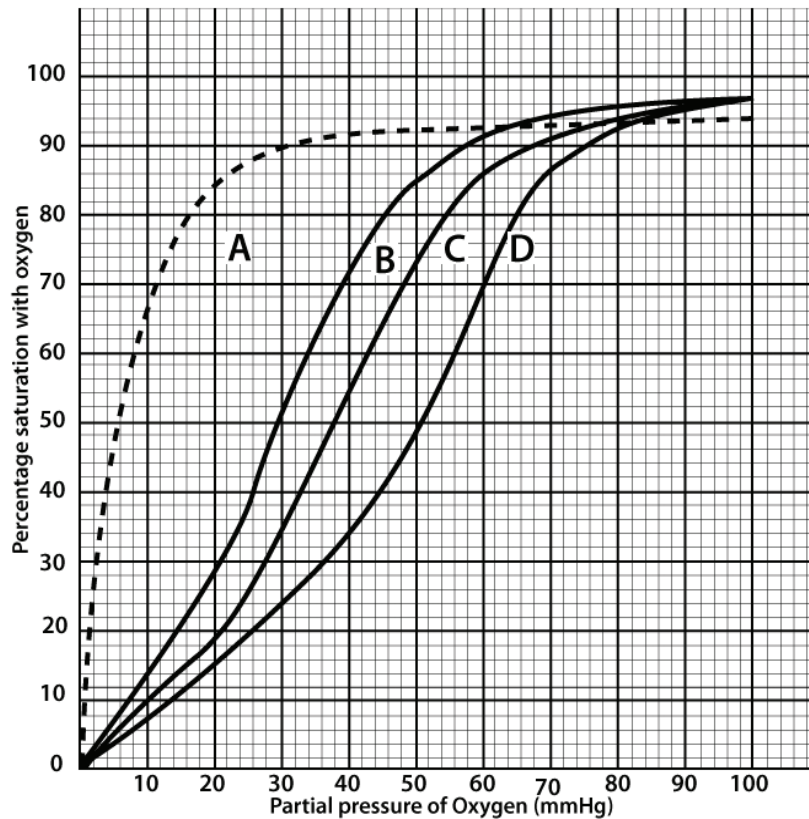
### INSTRUCTIONS TO CANDIDATES:

- *This paper consists of section 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 labelled diagrams where ever necessary.*
- *Write on the answer sheet, your name, index number and the questions*

## SECTION A

*Question one is compulsory)*

1. **Figure 1** shows the oxygen dissociation curves for human myoglobin, **A** and for human haemoglobin at three different partial pressures of carbon dioxide **B** at 15mmHg, **C** at 40 mmHg and **D** at 70 mmHg.



- Compare the percentage saturation with oxygen of myoglobin (curve **A**) and Haemoglobin (curve **B**) (07 marks)
- Explain the changes in the percentage saturation with oxygen of haemoglobin in curve **B** with increasing partial pressures of oxygen. (10 marks)
- Explain the effect of increasing the partial pressure of carbon dioxide on the oxygen dissociation curves for haemoglobin. (04 marks)
- Explain the position of the oxygen dissociation curve for myoglobin, relative to that of haemoglobin. (03 marks)
- Suggest and explain how each of the following condition will affect the position of oxygen dissociation curve **B**;
  - increased body temperature (04 marks)
  - small body size (05 marks)
  - climbing a mountain by man (04 marks)
- Why is haemoglobin an efficient respiratory pigment? (03 marks)

**SECTION B (*Attempt any three questions*)**

- 2 (a) State the distinguishing features of bryophytes. (04 marks)
- (b) Explain the reproductive adaptations in flowering plants that have contributed to their evolutionary success. (13 marks)
- (c) How are angiosperms better adapted reproductively than gymnosperms? (03 marks)
- 3 (a) Distinguish between natural and artificial selection (04 marks)
- (b) Explain the role and significance of meiosis in the evolutionary success of an organism (12 marks)
- (c) Under what circumstances will a new species be formed without a physical barrier in the population. (04 marks)
- 4 (a) Describe the process of energy flow in the ecosystem. (10 marks)
- (b) Describe the ecological impacts of the following activities.
- (i) Use of persistent pesticides (05 marks)
- (ii) Over fishing (05 marks)
- 5 (a) Describe the structure of a mitochondrion. (08 marks)
- (b) How is ATP produced from NAD in the mitochondrion? (08 marks)
- (c) Why is ATP a suitable energy store in cells? (04 marks)
- 6 (a) Explain the meaning of all-or-nothing law. (02 marks)
- (b) Describe how the action potential is generated in an axon of the neurone. (06 marks)
- (c) Explain the differences in sensitivity to colour and low light by different parts of the retina. (12 marks)

**END.**