P530/2
BIOLOGY
PAPER 2
JUL./AUG. 2025
$2^1/_2$ 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**.*

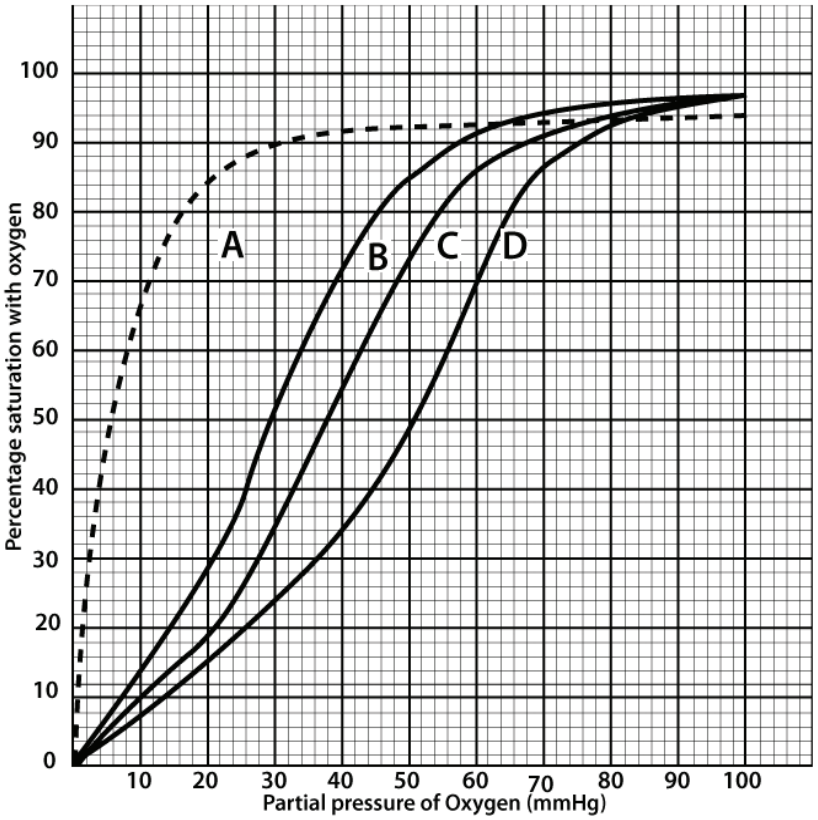
Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labelled diagrams where ever necessary.

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.



a) Compare the percentage saturation with oxygen of myoglobin (curve **A**) and and Haemoglobin (curve **B**) (*07 marks*)

b) Explain the changes in the percentage saturation with oxygen of haemoglobin in curve **B** with increasing partial pressures of oxygen. (*10 marks*)

c) Explain the effect of increasing the partial pressure of carbon dioxide on the oxygen dissociation curves for haemoglobin. (*04 marks*)

d) Explain the position of the oxygen dissociation curve for myoglobin , relative to that of haemoglobin. (*03 marks*)

e) Suggest and explain how each of the following condition will affect the position of oxygen dissociation curve **B**;

(i) increased body temperature (*04 marks*)

(ii) small body size (*05 marks*)

(iii) climbing a mountain by man (*04 marks*)

f) 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.