P530/2
BIOLOGY
PAPER 2
Jul/Aug, 2023
$2^1/_2$ hours

MATIGO MOCK EXAMINATION BOARD

Uganda Advanced Certificate of Education

BIOLOGY

(Theory)

Paper 2

2 Hours and 30 minutes.

INSTRUCTIONS TO CANDIDATES:

This paper consists of **six** *questions.*

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

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

Turn Over

SECTION A (40 MARKS)

1. Fig. **1** shows the oxygen dissociation curves for foetal haemoglobin (**P** and **Q**) and for maternal haemoglobin (**R** and **S**) at different pH values.

Fig. **2** shows the oxygen dissociation curves for haemoglobin of three mammals: Llama that lives at high altitudes, domestic cat and rat.

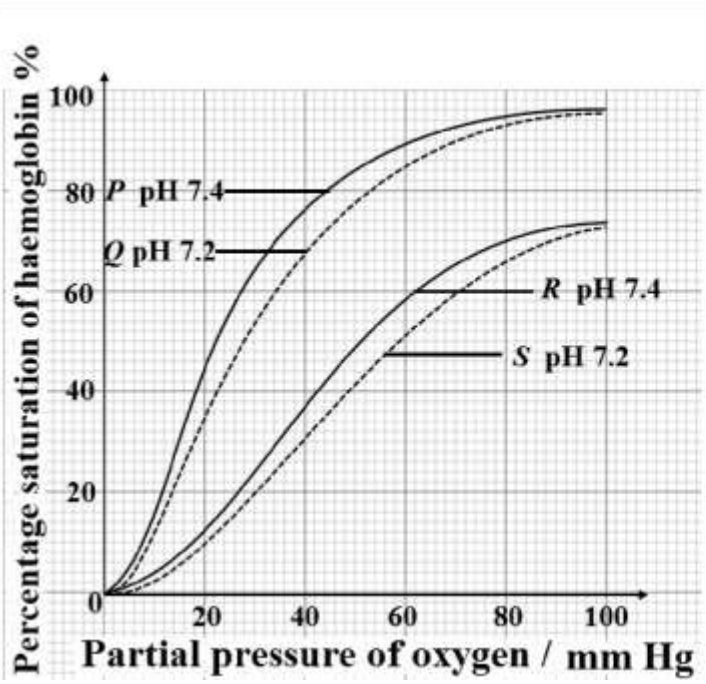

Fig. 1

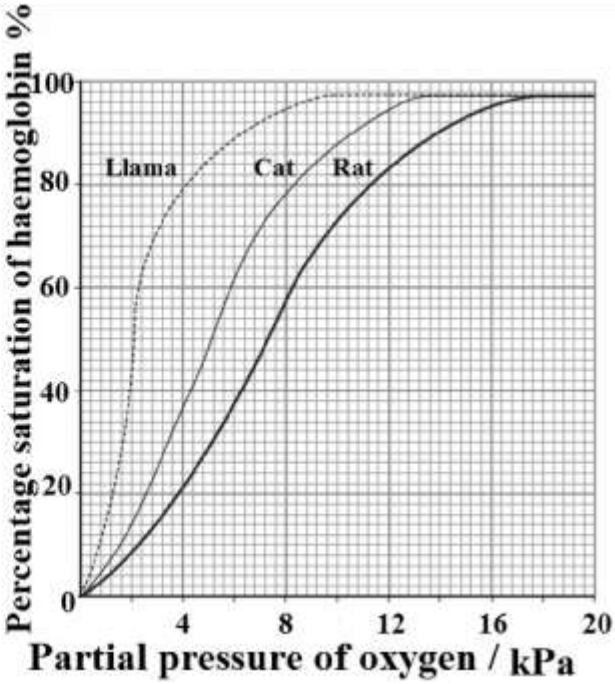

Fig. 2

(a) Describe the effect of ;

(i) Increasing partial pressure of oxygen on saturation of haemoglobin, in each of the figures (**Fig.**) **1** and **2**. (*06 marks*)

(ii) Decreasing pH on saturation of haemoglobin in fig. **1**. (*02 marks*)

(b) Explain the effect of;

(i) Increasing partial pressure of oxygen on saturation of haemoglobin. (*05 marks*)

(ii) Decreasing pH on saturation of haemoglobin. (*04 marks*)

(c) Compare the saturation of haemoglobin with oxygen in the foetus and mother. (*03 marks*)

(d) Account for the **difference** in saturation of haemoglobin between the

(i) Rat and cat (*06 marks*)

(ii) Foetus and mother (*05 marks*)

(e) Suggest with reasons,

(i) How the llama haemoglobin indicates **adaptation** for its environment. (*03 marks*)

(ii) The dissociation curve which could represent that of lugworm, from fig. **2**. (*03 marks*)

(iii) Why an expectant mother is advised to stop smoking? (*03 marks*)

SECTION B (60 MARKS)

Attempt only three (3) questions.

2.

(a) Describe the sources and fate of various wastes in living organisms. *(12marks)*

(b) Explain the role of loop of Henle in osmoregulation. *(08marks)*

3. (a) Explain with examples, the meaning of **biological control**. (*03 marks*)

(b) Outline the main stages involved in establishing biological control. (*07 marks*)

(c) (i) State the **advantages** of using biological agents over pesticides in Controlling pests. (*06 marks*)

(ii) What are the **limitations** of using biological control? (*04 marks*)

4. (a) Compare transcription and translation in protein synthesis. (*07 marks*)

(b) Explain the relationship between genes and polypeptides. (*09 marks*)

(c) Describe the structural features which adapt tRNA to its role in translation. (*04 marks*)

5. (a) Describe the

(i) Structure of a stamen. (*05 marks*)

(ii) Development of pollen grains and the male gametes of the flowering plant. (*11 marks*)

(b) Explain the differences between the stamens of flowers pollinated by insects and wind. (*04 marks*)

6.

(a) Describe how the epithelial tissue is suited for the function of;

(i) protection *(04marks)*

(ii) Gaseous exchange and absorption of food. *(08marks)*

(b) How are the requirements for efficient gaseous exchange fulfilled in the mammalian lungs and gills in fish? *(08marks)*

END

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