P530/2
BIOLOGY
THEORY
Paper 2
23 July 2018
2 ½ hours

ENTEBBE JOINT EXAMINATION BUREAU

Uganda Advanced Certificate of Education

BIOLOGY THEORY

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*Attempt **one** question in* **Section A** *and any* **three** *questions from* **Section B**.

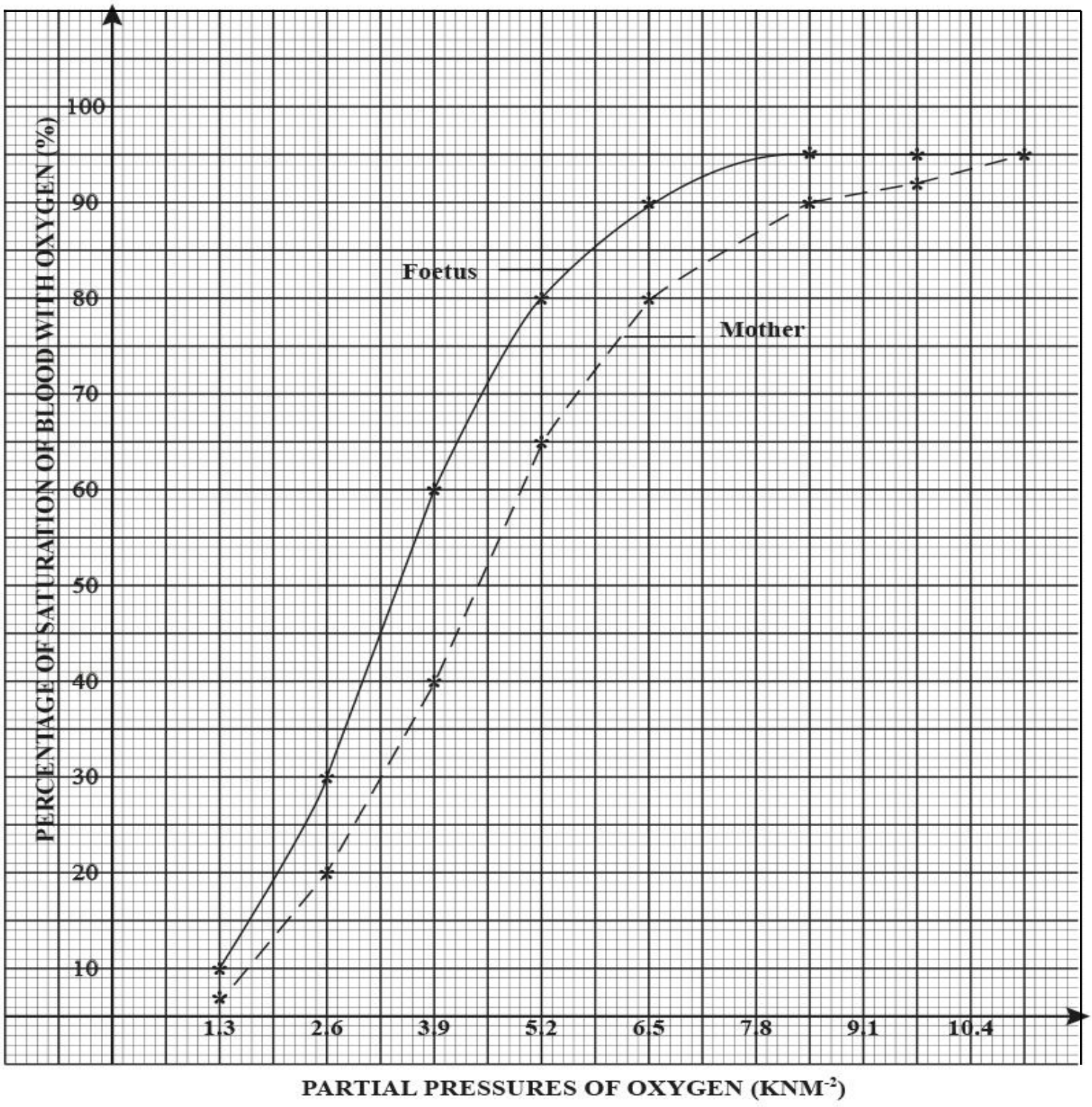
Candidates are advised to read questions carefully, organize their answers and present them precisely and logically.

Illustrate whenever necessary with well labeled diagrams.

Any extra questions **shall not** *be assessed.*

SECTION A (40 MARKS)

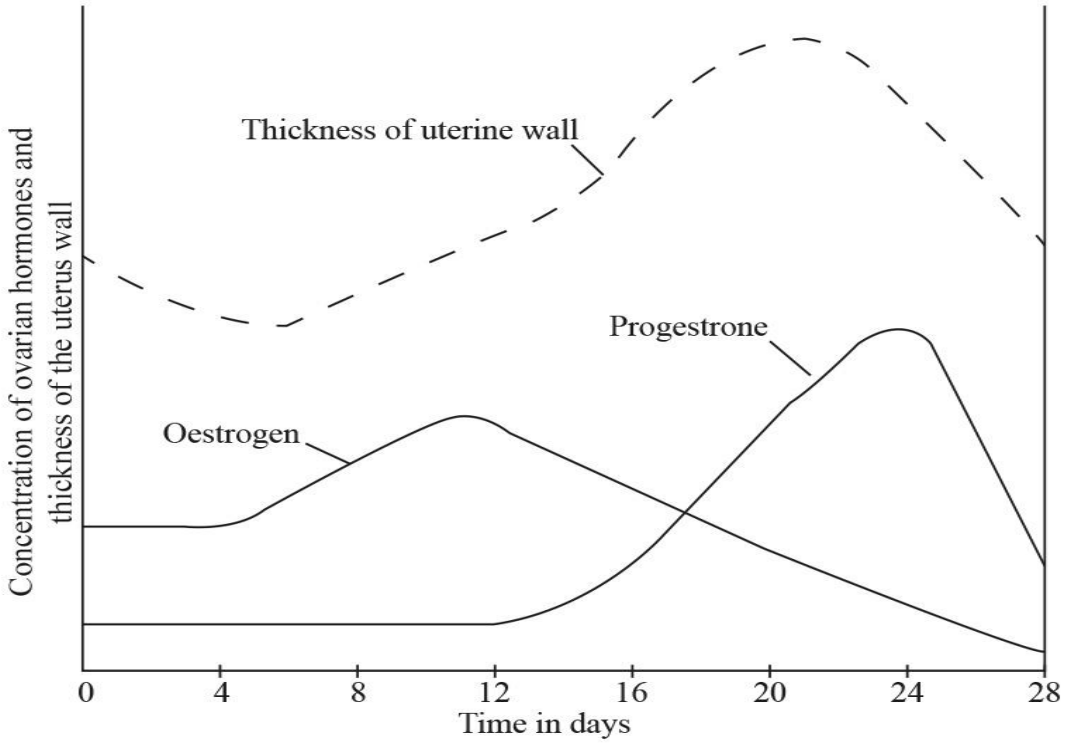
1. (a) The graph below shows the difference in the saturation of blood with oxygen between a pregnant mother and a foetus developing in the uterus at varying partial pressures of oxygen. Study the graph carefully and answer the questions that follow.



(i) Outline the differences between percentage saturation of blood with oxygen for the mother and that of the foetus. *(03 marks)*

(ii) Explain the significance of the position of the foetal curve. *(06 marks)*

(b) The graph below shows the changes in the sex hormones and thickness of the uterine wall obtained by close observations made using blood samples that were drawn from an adult female at regular intervals of days and by scanning the uterus respectively. The investigations were done after a period of a month (28 days) immediately after the previous menstruation period.



(i) Describe the changes in concentrations of oestrogen and progesterone hormones. *(07 marks)*

(ii) Compare the changes in the concentration of oestrogen hormone and the thickness of the uterine wall. *(06 mark)*

(iii) Explain the relationship between thickness of uterine wall and progesterone concentration. *(14 marks)*

(iv) State would happen if fertilisation had occurred on the 24th day of the month? *(04 marks)*

SECTION B

2. (a) With reference to specific examples, state the adaptation by various organisms for locomotion:

(i) **on land.** *(05 marks)*

(ii) **in air.** *(05 marks)*

(b) Give an account of the mechanism of flight in insects. *(10 marks)*

3. (a) What is meant by **protein denaturation**? *(04 marks)*

(b) Explain the factors that cause denaturation of proteins. *(10 marks)*

(c) Distinguish between fibrous and globular proteins. *(06 marks)*

4. (a) Describe how the method of fertilisation and other reproductive strategies in mammals have contributed to their evolutionary success. *(14 marks)*

(b) Explain the hormonal control of spermatogenesis. *(06 marks)*

5. (a) What is meant by **negative feedback** in body processes? *(04 marks)*

(b) Explain how each of the following affects the metabolism of carbohydrates:

(i) **Insulin** *(04 marks)*

(ii) **Adrenalin** *(03 marks)*

(c) Describe how sodium – potassium pump mechanism operates to achieve each of the following:

(i) Transport of glucose molecules across the cell membrane. *(04 marks)*

(ii) Maintenance of the resting potential across a membrane of a nerve cell. *(05 marks)*

6. (a) Distinguish between the arrangement of tissues for support in dicotyledonous and monocotyledonous plants. *(10 marks)*

(b) Explain how increase in girth is brought about in dicotyledonous and monocotyledonous plants. *(10 marks)*

END