

P530/2

Biology

(Theory)

JULY/AUG 2024

2 ½ hours

ASSHU ANKOLE JOINT MOCK EXAMINATIONS 2024 .

Uganda Advanced Certificate of Education

BIOLOGY

(THEORY)

P530/2

TIME: 2HOURS 30 MINUTES

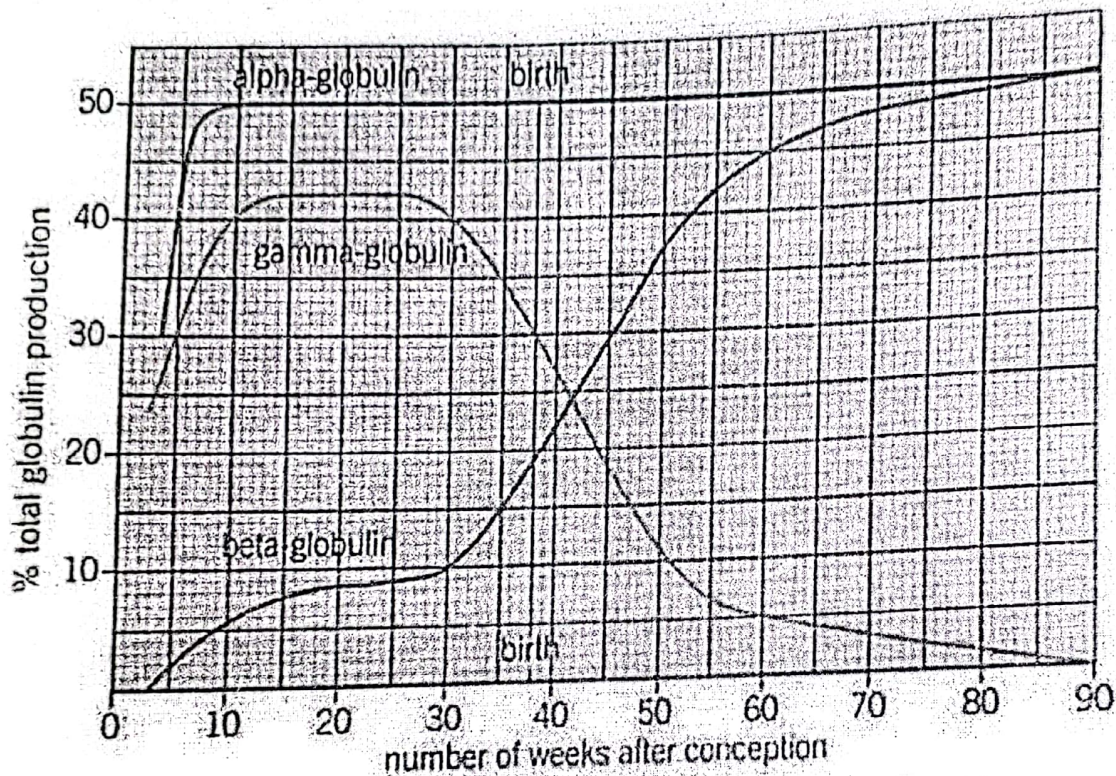
INSTRUCTIONS.

Answer question **ONE** in sectionA plus **THREE** others from section B

Read the questions carefully, organize and present the answers precisely and logically illustrating with well labelled drawings wherever necessary.

SECTION A (40MARKS)

1. A haemoglobin molecule is made up of four polypeptide chains each known as a globulin. In the adult humans, two of the polypeptides in a haemoglobin molecule are alpha-globulin and two are beta-globulin. In other words, 50% of the total globulin in all haemoglobin is alpha and 50% is beta. The graph in figure 2 below shows the percentage total globulin production during early human development. Study it carefully.



▲ **Figure 2** Percentage total globulin production during early human development

- a) Describe the changes in alpha-globulin production. (6marks)
- b) Compare the percentage globulin production for beta-globulin and gamma-globulin. (8marks)
- c) Explain the percentage globulin changes for;
 - i) Alpha- globulin. (3marks)

- ii) Gamma-globulin. (8marks)
- iii) Beta-globulin. (12marks)
- d) What is the effect of altitude changes on haemoglobin affinity? (3marks)

SECTION B (60 MARKS)

2. a) Discuss the properties of hormones and factors that can cause hormonal release in the body. (10marks)
- b) Describe the mechanism of action of a peptide hormone. (10marks)
3. Relate the properties of water to their significance to living organisms. (20 marks)
4. a) Outline the features of the genetic code. (8 marks)
- b) Describe how abnormal haemoglobin that results in sickle cell arises in humans. (12marks)
5. a) Explain what happens to the pyruvate in the a respiring cell in the presence of oxygen. (13marks)
- b) State the adaptations of mitochondrion to respiration. (7marks)
6. a) Explain the features of an efficient homeostatic system. (5marks)
- b) Describe how the kidney is involved in;
 - i. Sodium ion and blood volume control. (10marks)
 - ii. Control of blood and tissue fluid pH. (5marks)

SUCCESS