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

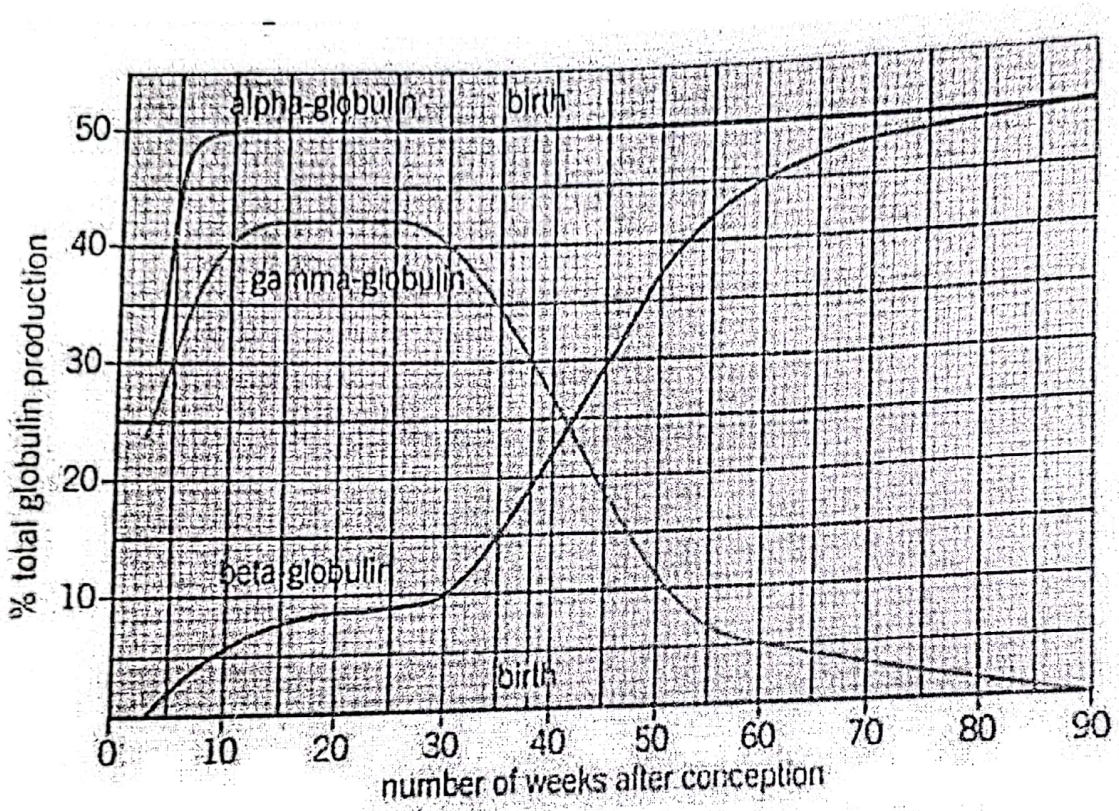
INSTRUCTIONS.

Answer question **ONE** in section**A** 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 belowshows 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) Discus 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