THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

133/2

BIOLOGY 2
(For Both School and Private Candidates)

Time: 2½ Hours **Wednesday 15 May 2002 p.m.**

Instructions

1. This paper consists of sections A, B and C
2. Answer **FIVE (5)** questions including at least **ONE (1)** question from each section.
3. Each question carries 20 marks
4. Read each question carefully before you start answering it.
5. Cellular phones are **not** allowed in the examination room.
6. Write your Examination Number on every page of your answer booklet.

This paper consists of 5 printed pages

SECTION A

1. Figures 1 and 2 below show two types of cells.

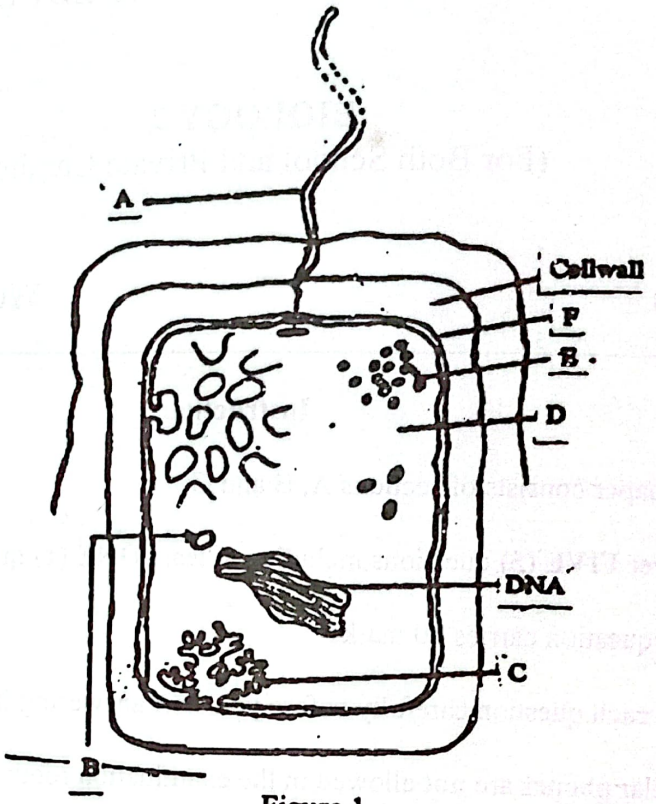

Figure 1

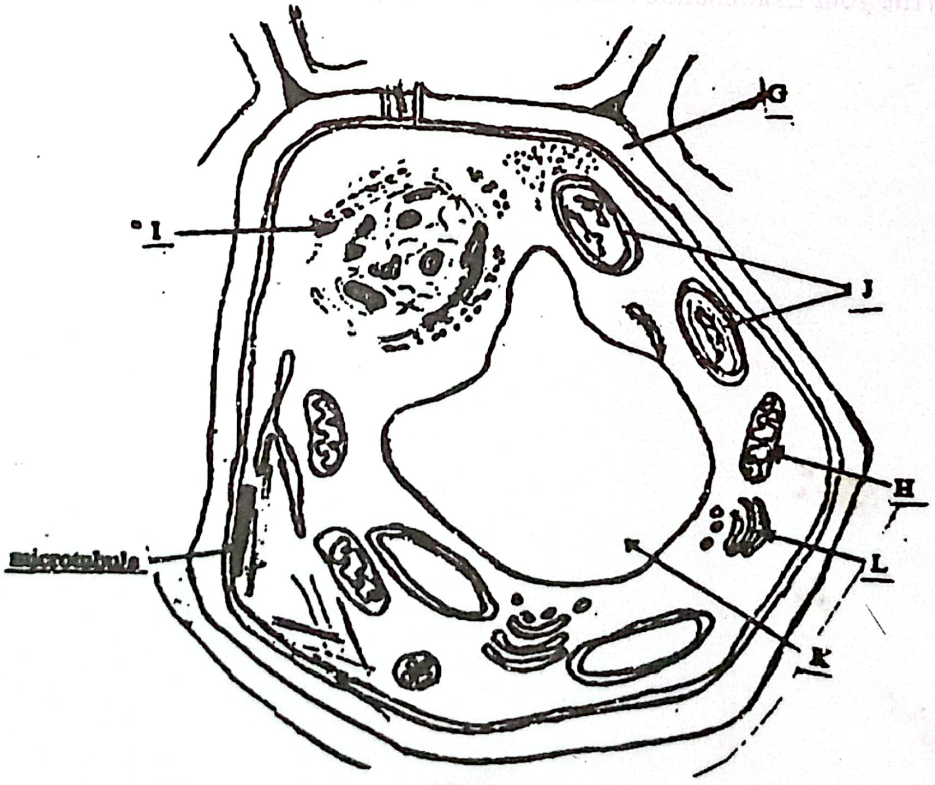

Figure 2

(a) Which figure represents
   (i) prokaryotic cell
   (ii) eukaryotic cell?

(b) Name the parts labelled A to L.

(c) Describe the major differences between the cells represented by Figures 1 and 2.

2. Write an account of the features which have made arthropods the most successful group of the animal kingdom.

SECTION B

3. In the Air Chalinze bus tragedy, Mama Wakuja, 22 years old, had her pituitary and pancreas glands irreparably injured. Give an account of the neurological and endocrine problems she is likely to face.

4. (a) Explain how the production of the digestive juices in mammals is induced.

   (b) How is the ileum adapted for food absorption?

5. Describe the hormonal feedback mechanism involved in the control of blood osmotic pressure.

6. The diagrams in Figures 3 and 4 below show parts of the blood circulation of human foetus and adult.

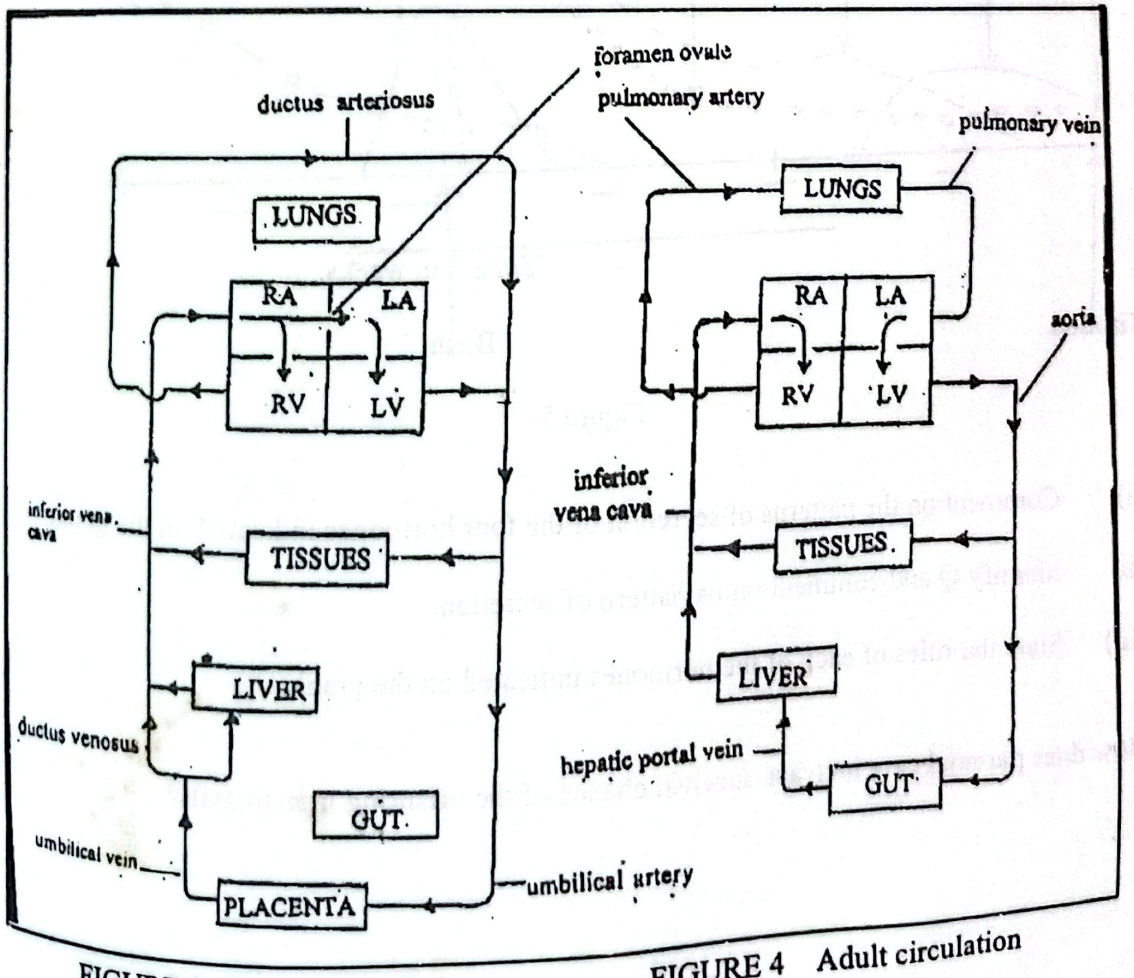

FIGURE 3 Foetal circulation: FIGURE 4 Adult circulation

(a) Describe four differences, visible in the diagram between foetal and adult circulation. What is the functional significance of each difference?

(b) Give a brief account for the changes that occur in foetal circulation at birth and soon after birth.

7. (a) The graph below (Fig. 5) shows the changes in the blood concentration levels of hormones involved in pregnancy, birth and lactation.

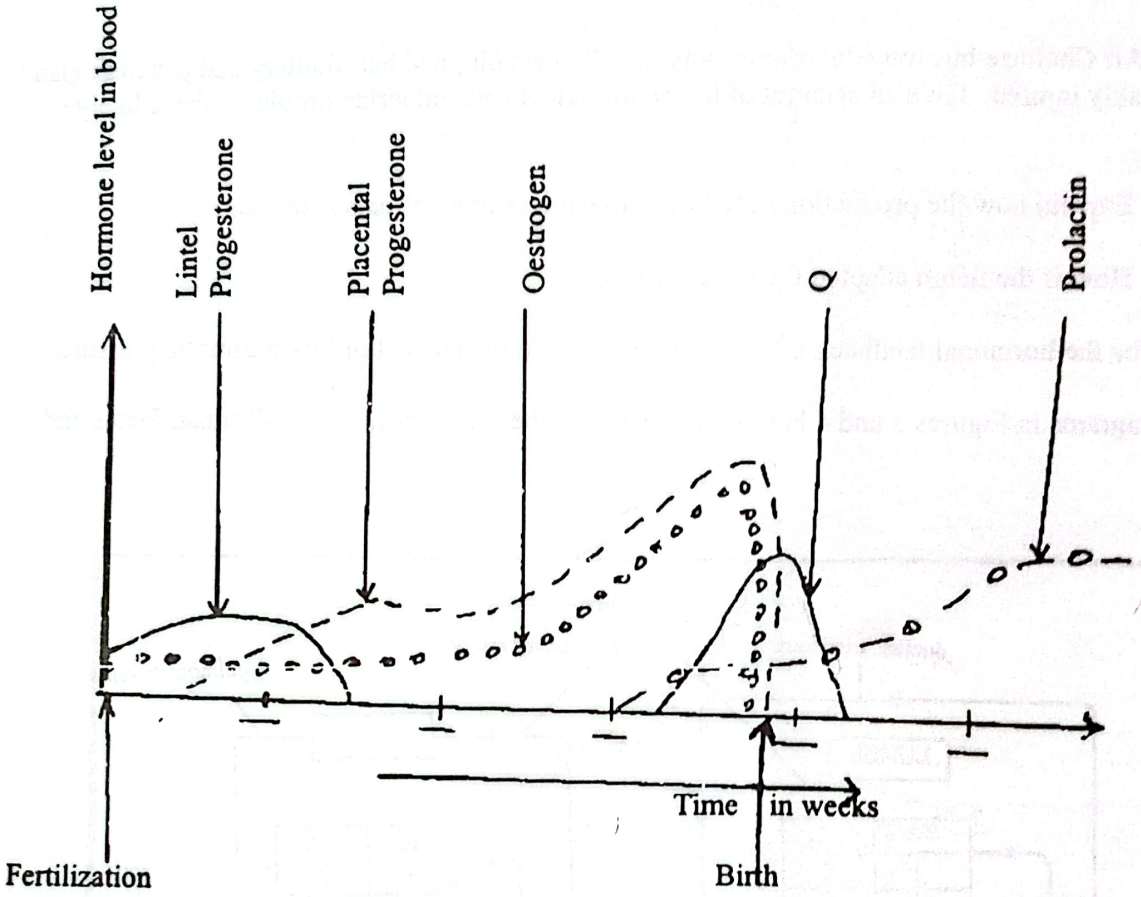

Figure 5

(i) Comment on the patterns of secretion of the four hormones indicated on the graph.

(ii) Identify Q and comment on its pattern of secretion.

(iii) State the roles of each of the hormones indicated on the graph.

(b) How does parental care increase survival chance of the offspring in mammals?

SECTION C

8. (a) What are sex chromosomes?

(b) In the fruitfly, Drosophila, white eye is a sex linked recessive mutation. In a laboratory experiment, homozygous red eyed females were crossed with white eyed males and the F1 progeny allowed to interbreed at random. Explain why only 25% of the F1 progeny had white eyes and were all of the same sex.

9. (a) Identify the components of the ecosystem and explain how they interact.

(b) Discuss the measures which should be observed when conserving the environment.