

**THE REGIONAL INSPECTORATE OF PEDAGOGY FOR SCIENCE AND
THE LIFE SCIENCE TEACHERS' ASSOCIATIONS (LISTA)**

FRIDAY: 17/3/2023- Afternoon

ADVANCED LEVEL

Subject Title	BIOLOGY
Paper Number	Paper 2
Subject Code Number	0710

THREE HOURS

INSTRUCTIONS TO CANDIDATES:

Answer any FIVE out of the eight questions.

If more than five questions are answered, only the first five will be assessed.

All questions carry equal marks. Marks allocated to parts of questions are indicated in brackets.

Illustrate your answers wherever desirable with large, clear and fully labelled diagrams.

You are reminded of the necessity for good English and orderly presentation in your answers.

1. (a) (i) What is a protein?
(ii) How is the structure of the protein adapted to its many functions?
(b) Why are amino acids said to be amphoteric?
(c) Outline the functions of lipids in the life of plants and animals.

(4, 5, 3, 8 marks)
(Total = 20 marks)

2. (a) State the properties of enzymes.
(b) Explain the following types of enzyme inhibition.
(i) Noncompetitive inhibition.
(ii) Allosteric inhibition. *Allosteric binds on a separate site*
(c) Explain how temperature and substrate concentration affect the rate of enzyme catalyzed reactions.

(5, 6, 9 marks)

(Total = 20 marks)

3. (a) Define the following terms:
(i) Parthenogenesis.
(ii) Cortical reaction.
(iii) Acrosome reaction.
(b) Explain the process of Spermatogenesis in man.
(c) State the advantages of vegetative propagation.
(d) Differentiate between mitosis and meiosis.

(6, 6, 3, 5 marks)

(Total = 20 marks)

4. (a) Draw the structure of a nephron and its associated blood vessels.
(b) Describe the process of urine formation in mammals.
(c) What is the role of antidiuretic hormone (Vasopressin) in the formation of a concentrated urine?

(7, 10, 3 marks)

(Total = 20 marks)

5. (a) Outline the difference between the following:
(i) Food chain and food web.
(ii) Pyramid of biomass and pyramid of energy.
(b) Explain the following ecological concepts.
(i) Ozone layer depletion.
(ii) Acid rain.
(iii) Eutrophication.

(8, 12 marks)

(Total = 20 marks)

6. (a) Describe the main stages of the Calvin cycle.
(b) Distinguish between.
(i) Mitochondria and chloroplast.
(ii) C₄ and C₃ plants.
(b) What is the role of NADP in photosynthesis?

(6, 10, 4 marks)

(Total = 20 marks)

7. (a) Define the following terms:
(i) Water potential.
(ii) Solute potential.
(b) Describe the path taken by water in an angiosperm plant from the soil into and across the roots.
(c) Discuss FIVE forces that move water and mineral ions from the roots to the leaves of plants.

(4, 6, 10 marks)

(Total = 20 marks)

8. (a) (i) Define the term fermentation as used in biotechnology.
(ii) How can a transgenic bacterium be cultured in an industrial fermenter to produce a useful product?

(b) Explain the role of microorganisms in the production of:

- (i) Cheese.
(ii) Yoghurt

(2, 8, 5, 5 marks)

(Total = 20 marks)

END