



ZIMBABWE SCHOOL EXAMINATIONS COUNCIL
General Certificate of Education Advanced Level

BIOLOGY
PAPER 3 FREE RESPONSE

6030/3

NOVEMBER 2023 SESSION

2 hours 30 minutes

Additional materials:
Answer paper

TIME: 2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces provided on the answer paper/answer booklet.

Answer any **five** questions.

Write your answers on the separate answer paper provided.

On the first page of your answer sheet, indicate the questions you have attempted.

If you use more than one sheet of paper, fasten the sheets together.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.

You are reminded of the need for good English and clear presentation in your answers.

This question paper consists of 3 printed pages and 1 blank page.

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[Turn over



- 1 (a) Describe the mechanism of transport across cell membranes during [4]
(i) endocytosis, [4]
(ii) osmosis. [4]
- (b) (i) Explain the role of cholesterol in cell surface membranes. [3]
(ii) Distinguish between a lysosome and a ribosome. [3]
- (c) (i) Describe the structure of phospholipids. [3]
(ii) Relate the structure of phospholipids to function. [3]
- 2 (a) Describe the formation and breakage of a glycosidic bond. [8]
(b) Explain the induced fit theory of enzyme action. [6]
(c) Discuss the relationship between structure and function in
(i) haemoglobin, [3]
(ii) glycogen. [3]
- 3 (a) Outline the
(i) features of homologous chromosomes, [4]
(ii) events that occur during prophase of mitosis. [4]
(b) Justify the need for meiosis in living organisms. [6]
(c) Distinguish between directional and stabilising selection. [6]
- 4 (a) Describe the features of the genetic code. [8]
(b) Explain the process of gel electrophoresis. [6]
(c) Distinguish between transcription and translation. [6]



- 5 (a) Describe [4]
- (i) cyclic phosphorylation, [4]
 - (ii) the link reaction during aerobic respiration. [4]
- (b) Explain why ATP is regarded as the universal “energy currency” in living organisms. [6]
- (c) Explain the importance of mitochondrial DNA. [6]
- 6 (a) Describe, with reference to invitro fertilisation, the [4]
- (i) fertilisation stage, [4]
 - (ii) embryo transfer stage. [4]
- (b) Explain the relationship between global distribution of sickle-cell anaemia and malaria. [6]
- (c) Discuss the socio-economic importance of organisms in phylum Filicinophyta (ferns). [6]
- 7 (a) Describe the structure of [4]
- (i) an artery, [4]
 - (ii) a vein. [4]
- (b) Distinguish between sensory and motor neurons. [6]
- (c) Discuss conflicts of interest between conservationists and crop farmers. [6]

