BINDURA UNIVERSITY OF SCIENCE EDUCATION

BIOLOGICAL SCIENCES DEPARTMENT

BScBZH/ HBSc Ed/ BScEd

BIOTECHNOLOGY (BZH 213)

EXAMINATION
2 HOURS (100 MARKS)

NOV 2024

INSTRUCTIONS TO CANDIDATES

Answer FOUR questions. You MUST answer QUESTION 1 (Section A) and any THREE questions from section B. Each question carries 25 MARKS. Where a question contains sub-divisions, the mark value of each sub-division is given in brackets. Illustrate your answer where appropriate with large clearly labelled diagrams. You should not spend more than thirty minutes on each question.

SECTION A (COMPULSORY)

1. (a) Describe estimation of DNA fragment size using gel electrophoresis. (8 marks)
   (b) Explain three factors affecting migration of DNA in agarose gels. (9 marks)
   (c) Outline use of gel electrophoresis in nucleic acid quantification. (8 marks)

SECTION B

2. (a) Describe the preparation of cDNA library. (15 marks)
   (b) Explain the advantages of cDNA over genomic DNA libraries. (10 marks)

3. Discuss *Agrobacterium*- mediated gene transfer and its applications in agriculture.

4. Write short notes on any **FIVE** of the following:
   (a) Cartagena protocol of biosafety. (5 marks)
   (b) In vitro production of secondary metabolites. (5 marks)
   (c) Northern blotting. (5 marks)
   (d) Use of PCR in cloning. (5 marks)
   (e) Shuttle vectors. (5 marks)
   (f) Reverse genetics. (5 marks)

5. Write an essay on gene therapy.

6. Give an account of the procedures for assessment of general release of genetically modified organisms.

END OF EXAMINATION QUESTION PAPER