BINDURA UNIVERSITY OF SCIENCE EDUCATION
BIOLOGICAL SCIENCES DEPARTMENT
BScBZH/ HBScBioTec/ HBScEd/ BScEd
MOLECULAR GENETICS (BZH 208/ BTEC212)

EXAMINATION

MAR 2024

2 HOURS (100 MARKS)

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 the cetyl trimethylammonium bromide (CTAB) method for plant genomic DNA isolation. (15 marks)

   (b) Compare and contrast the CTAB method to the kit- based methods of extraction. (10 marks)

SECTION B

2. Write short notes on any FIVE of the following:
   (a) Eukaryotic gene structure. (5 marks)
   (b) DNA replication errors. (5 marks)
   (c) Interspersed repetitive elements of the human genome. (5 marks)
   (d) Polymerase Chain Reaction (PCR) experimental design. (5 marks)
   (e) Features of the DNA double helix model. (5 marks)
   (f) Suppressor mutations. (5 marks)

3. (a) Give a detailed account of pyrimidine nucleotides biosynthesis. (18 marks)
   (b) Describe the biological significance of nucleotides. (7 marks)

4. (a) Explain the significance of genetic code in gene expression. (20 marks)
   (b) Outline exceptions to the genetic code. (5 marks)

5. Describe the roles of chromatin and differential RNA processing in regulating gene expression.

6. Write an essay on the clinical, forensic, and agricultural applications of PCR.

END OF EXAMINATION QUESTION PAPER