BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
BIOLOGICAL SCIENCES DEPARTMENT
HBScBioTec
Animal Biotechnology (BTEC218/ BTEC 237/ BZH408)

EXAMINATION
2 HOURS (100 MARKS)

INSTRUCTIONS
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 subdivisions, the mark value of each subdivision is given in brackets. Illustrate your answers, where appropriate, with large, clearly labelled diagrams. You should not spend more than thirty minutes on each question.

SECTION A (COMPULSORY)

1. Describe a procedure used to clone a viral coat gene into the plasmid pUC18.

SECTION B

2. Describe the development of the following products using tissue culture:
   a) Monoclonal antibodies (15 marks)
   b) Viral vaccine. (10 marks)

3. Describe the development of a transgenic fish species for each of the following uses:
   a) Food production (13 marks)
   b) Research and (7 marks)
   c) Recreation. (5 marks)

4. a) Briefly discuss the following approaches in developing transgenic animals:
      i. Pronuclear injection (12 marks)
      ii. Embryonic stem cell method. (13 marks)

5. a) Outline the steps involved in the treatment of ADA-SCID using retroviral gene therapy. (15 marks)
   b) Discuss the advantages and disadvantages of using retroviruses in gene therapy. (10 marks)

6. Discuss the ethical considerations in using animals for research.

END OF PAPER