BINDURA UNIVERSITY OF SCIENCE EDUCATION
BIOLOGICAL SCIENCES DEPARTMENT
HBScBioTec
Animal biotechnology (BTEC 237)

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 the procedures used to culture animal cells *in vitro*.

SECTION B

2. a) Describe the development of transgenic fish. (15 marks)
   b) List the advantages and disadvantages of using transgenic fish. (10 marks)

3. a) Describe a cloning technique that was applied to develop the sheep Dolly. (15 marks)
   b) Briefly describe two major risks of cloning animals. (10 marks)

4. a) Define the term 'animal model' according to modified Weggler's definition. (6 marks)
   b) A researcher is set to determine novel signalling mechanisms in the ovary during oocyte maturation and ovulation. As a biochemist, state the appropriate animal model for this study giving reasons for your choice. (10 marks)
   c) Describe the 3R strategy for alternative approaches to animal testing. (9 marks)

5. Describe the use of microinjection and electroporation techniques in the production of hepatitis B virus vaccine.

6. Using HIV as an example, discuss the applications of gene therapy in human disease.

END OF EXAMINATION QUESTION PAPER