

# **BINDURA UNIVERSITY OF SCIENCE EDUCATION**

## **DEPARTMENT OF BIOLOGICAL SCIENCES**

### **BSc HONOURS IN BIOLOGICAL SCIENCES**

#### **PLANT BIOTECHNOLOGY (BZG 406/ BZH404 / BTEC236/ BTEC417)**

**EXAMINATION**

**2 HOURS**

**JUN 2024**

#### **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. (a) Explain the concept of plant tissue culture and its applications in plant biotechnology. (13 marks)
- (b) Describe a method that is used to introduce foreign genes into plants. (12 marks)

#### **SECTION B**

2. (a) Explain the term "transgenic plant" and the importance of transgenic plants in agriculture. (15 marks)
- (b) Provide an example of a transgenic plant and describe the specific genetic modification it possesses. (10 marks)
3. (a) Explain the process of somatic embryogenesis. (10 marks)
- (b) Discuss the applications of somatic embryogenesis in plant biotechnology. (15 marks)
4. (a) Describe the process of gene expression in plants, including transcription and translation.
5. (a) Explain the use of genetic engineering in crop improvement. (15 marks)
- (b) Highlight the ethical considerations associated with genetic engineering in plants. (10 marks)
6. (a) Outline strategies that are used to enhance genetic diversity in plant populations. (10 marks)
- (b) Discuss the significance of genetic diversity in plant breeding. (15 marks)

**END OF EXAMINATION QUESTION PAPER**