

# BINDURA UNIVERSITY OF SCIENCE EDUCATION

## FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

AGH410/AGH411

Department of Crop Science  
BSc Agricultural Science (Honours) Part IV Examination  
Crop Biotechnology

3 HOURS (100 Marks)

### INSTRUCTIONS

Answer any **FOUR** questions. Each question carries **25 marks**.

OCT 2023

1. Outline how you would use micropropagation in the production of sweet potato vines. **[25 marks]**
2. (a) Explain how the delivery of a transgene can be optimised. **[10 marks]**  
(b) Explain the choice of the binary vector system over the co-integrative system in genetic engineering. **[15 marks]**
3. Write notes on importance and availability of the following components of growth media
  - (a) Amino acids. **[3 marks]**
  - (b) Growth hormones. **[12 marks]**

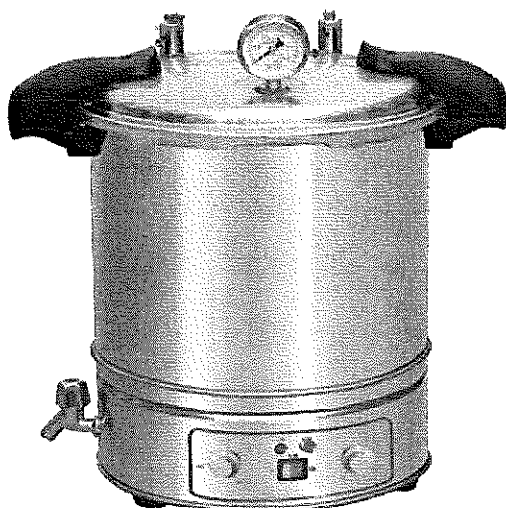


Figure 1

- (c) Explain the operation of the piece of equipment shown in Fig.1 in tissue culture work. **[10 marks]**
4. (a) Explore methods of controlling any 5 disorders during tissue culturing. **[15 marks]**  
(b) Give an outline of the different types of biotechnology. **[10 marks]**
5. (a) Discuss the methods of GMO testing. **[12 marks]**  
(b) Outline with examples how biotechnology can be used to turn farmers from primary producers to secondary and tertiary producers and also to conserve the environment. **[10 marks]**  
(c) State any 3 gene cloning vehicles. **[3 marks]**
6. (a) Explain the significance of meristematic tissue culture in crop production. **[15 marks]**  
(b) Outline the process of morphogenesis. **[10 marks]**

**End of paper**