BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

AGC208

Department of Crop Science
BSc Agricultural Science (Honours) Part II Examination
Population and Quantitative Genetics

3 HOURS (100 Marks)

INSTRUCTIONS

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

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1. Outline the assumptions of the Hardy-Weinberg Equilibrium. [25 marks]

2. (a) Explore the significance of heritability to plant breeding. [10 marks]

   (b) Describe the different self-incompatibility systems. [15 marks]

3. (a) 2n=6x=42 explain the meaning. [3 marks]

   (b) Write notes on the following;
   - i. spontaneous mutations, [5 marks]
   - ii. importance of selection, [8 marks]
   - iii. breeding value and genotypic value and, [5 marks]
   - iv. significance of doubled haploids to plant breeding. [4 marks]

4. Assess the application of the breeders' equation to plant breeding. [25 marks]

5. Write notes on the following types of selection;
   a) Directional selection
   b) Stabilizing selection
   c) Disruptive selection
   d) Tandem selection
   e) Independent culling

6. (a) Outline the three main types of heterosis. [10 marks]

   (b) Discuss the three theories used to explain heterosis. [15 marks]

End of paper