BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE
AGA407

Department of Animal Science
BSc Agricultural Science Part IV Examination
Livestock Improvement

3 HOURS (100 Marks)
INSTRUCTION: Answer any **FOUR** questions. Each question carries **25 marks**

1. Discuss the importance of Genetic and Non Genetic Factors in Livestock Improvement **[25 marks]**

2.
   a. Explain how the following techniques improve EBVs;
      i. Use of transgenic animals. **[5 marks]**
      ii. Progeny testing. **[5 marks]**
      iii. Sire Referencing. **[5 marks]**
   b. Define the following terms;
      i. Rate of Response to selection. **[5 marks]**
      ii. Quantitative Trait Loci (QTL). **[5 marks]**

3.
   a. Compute the accuracy of genetic evaluation when animals are selected based on the following conditions;
      i. Individual`s own performance records (n = 8), trait heritability = 0.65 **[5 marks]**
      ii. Individual`s own performance records (n = 100), trait heritability = 0.05 **[5 marks]**
      iii. Progeny test based on 8 offspring each with 1 record, trait heritability = 0.15 **[5 marks]**
      iv. Progeny test based on 78 offspring each with 3 records, trait heritability = 0.75 **[5 marks]**
   b. Describe how heritability varies with repeatability for a given trait and how accuracy of EBVs responds. **[5marks]**

4. Discuss the following multiple trait selection methods;
   a. Index Method. **[5 marks]**
   b. Tandem Selection. **[5 marks]**
   c. Independent culling. **[5 marks]**
   d. Correlated Response. **[5 marks]**
   e. Mental index. **[5 marks]**

5. Describe how you would set up a Group Breeding Scheme for the genetic improvement of Mashona cattle in A2 farms. **[25 marks]**

6. The science and practise of animal breeding did not only give positive results but negative ones too. Discuss, giving examples, of the negative effects of animal breeding recorded to date.

[25 marks]