

# Uganda Martyrs University

## Faculty of Agriculture

Final Examination: 2015-2016

Bachelors of Science in Agriculture Year Three

Bachelors of Science in Organic Agriculture Year Three

**Module: AG/09& OA/11 Commodity Improvement and Biotechnology**

Time: 09:30 am – 12:30 pm

Date: Tuesday 12<sup>th</sup> July 2016

### Instructions:

- Read and understand the questions before answering
- Answer any 4 questions
- Start each answer on a separate answer sheet

- 1 The Hardy-Weinberg's law is a very important aspect in crop and animal breeding.  
State the Hardy-Weinberg's law **3 marks**
- a) Write out the Hardy-Weinberg equation and clearly explain **7 marks**  
b) each component of the equation **15 marks**  
c) Discuss the factors influencing the Hardy-Weinberg's equation **10marks**
- 2a) Describe the role of the National Seed Certification Service **15 marks**  
Define 'seed vigour' and elaborate on the characteristics of a good seed vigour test. **15 marks**
- b) **15 marks**
- 3 With reference to crop varieties released by research institutions in Uganda, discuss the plant breeding objectives **25 marks**
- 4a) Explain the procedure for pure-line breeding **15 marks**  
Outline the merits and demerits of mass selection **10 marks**
- b) **2 marks**
- 5a) Define 'seed priming' **20 marks**  
Discuss four types of seed priming
- b) **3 marks**
- c) What are the benefits of seed priming?
- 6 Contrast the following terminologies as used in crop and animal improvement  
Phenotypic variation vs Genotypic variation **5 marks**

- a) The law of segregation vs The law of independent assortment **10 marks**
- b)
- c) Qualitative traits vs Quantitative traits **5 marks**  
 Inbreeding depression vs Heterosis **5 marks**
- d)
- 7a) Define the following terminologies as used in conservation of genetic resources
- i- Plant Genetic Resources **2 marks**
  - ii- In-situ conservation of plant genetic resources **3 marks**
  - iii- Ex-situ conservation of plant genetic resources **3 marks**
- Outline the sources of plant genetic resources **5 marks**
- b)
- c) What is the importance of conserving plant genetic resources? **12 marks**
- 8a) Why is it important to have a law governing the use of genetically modified organisms? **15 marks**
- Define 'Multiple Ovulation and Embryo Transfer' and outline its merits and demerits **10 marks**
- b)