JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

SECOND YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE

2017/2018 ACADEMIC YEAR

REGULAR

COURSE CODE: AHT 3224

COURSE TITLE: Plant Breeding

EXAM VENUE: **STREAM: BSc. Horticulture.**

DATE: **EXAM SESSION:**

TIME: 2 HOURS

Instructions:

1. **Answer ALL the questions in section A and any TWO in section B.**
2. **Candidates are advised not to write on question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A [30 MARKS]

Answer ALL questions from this Section.

Q1.

(a) When is markers assisted selection worthwhile? (2 marks)

(b) Explain how qualitatively inherited traits can be distinguished from quantitatively inherited traits. Use diagrams where necessary (3 marks)

(c) Using formulae and variances explain what constitutes the phenotypic value of an individual (3 marks)

(d) Using formulae differentiate between broad and narrow sense heritability (2 marks)

Q2.

(a) What determines the cost of markers assisted selection (3 marks)

(b) If heterozygosity (H) was initially 0.6, what would be the expected level of heterozygosity after 5 generations? (3 marks)

(c) Highlight the procedure involved in pure line breeding (4 marks)

Q3.

(a) With aid of a diagram, explain the four types of selection differentiated by choice of mating system and the choice of original population chosen as parents (4 marks)

(b) State and explain three major things a breeder should consider while breeding for resistance (3 marks)

(c) Differentiate the following variances: Additive, Dominance and Epistasis (3 marks)

SECTION B [40 MARKS]

Answer any TWO QUESTIONS from this Section.

Q4. (a) Define agamospermy and discuss three known forms of agamospermy (10 marks)

(b) Discuss polyploidy and its role in plant improvement (10 marks)

Q5. (a) Briefly discuss heterosis highlighting its genetic basis and significance in plant breeding (10 marks)

(b) Write notes the following:

(i) Plant introduction (3 marks)

(ii) Centers of origin of Crop Plants (4 marks)

(iii) Clonal selection (3 marks)

Q6. (a) Explain the molecular basis of mutations with suitable examples and importance of mutation in plant breeding (10 marks)

(b) Write an account on the process of Apomixis and its use in crop improvement (10 marks)