



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
AGRICULTURE EXTENSION AND EDUCATION**

2024/2025 ACADEMIC YEAR

SIAYA

COURSE CODE: APB 2208

COURSE TITLE: PRINCIPLES OF PLANT BREEDING

EXAM VENUE:

STREAMS: BSc. Agriculture Extension and Education

DATE:

EXAM SESSION:

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 Questions 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 in this Section.

- 1 a. Recombinant gametes are normally more than parental gametes a) True b) False. (1 mark)
- b. Using formulae and variances explain what constitutes the phenotypic value of an individual. (3 marks)
- c. Using formulae differentiate between broad and narrow sense heritability. (3 marks)
- d. If heterozygosity (H) was initially 0.5, what would be the expected level of heterozygosity after 4 generations? (3 marks)
2. a. Define mutation and its importance in plant breeding. (4 marks)
- b. How does plant breeding utilizes trait variation. (3 marks)
- c. Explain three major things a breeder should consider while breeding for resistance. (3 marks)
3. a. State and explain applications of genetic engineering in plant breeding. (4 marks)
- b. State four advantages of tissue culture in plant improvement. (4 marks)
- c. Differentiate between synthetics and composites. (2 marks)

SECTION B [40 MARKS]

Answer any TWO QUESTIONS in this Section.

- Q4. (Q5. (a) Briefly discuss heterosis highlighting its genetic basis and significance in plant Breeding. (10 marks)
- (b) Write notes on the following:
- (i) Plant introduction (3 marks)
- (ii) Centers of origin of Crop Plants (4 marks)
- (iii) Clonal selection (3 marks)
- Q5. Draw a schematic diagram of pedigree method. Briefly explain its merits and demerits. (20 marks)
- Q6. Discuss molecular markers used in plant breeding; highlight their merits, demerits and applications. (20 marks).