NATIONAL OPEN UNIVERSITY OF NIGERIA

Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science

DEPARTMENT OF BIOLOGICAL SCIENCES

2024_2 EXAMINATION

COURSE CODE: BIO309
COURSE TITLE: PLANT BREEDING
CREDIT UNIT: 3 UNITS
TIME ALLOWED: 3 HOURS

INSTRUCTION: ANSWER QUESTION ONE AND ANY THREE OTHERS.

1ai. When a desirable trait has been bred into a species, what must the breeder do to make the new plant similar to the favored parent as possible? **(3 marks)**

1aii. Mention the modern plant breeding techniques that you know. **(6 marks)**

1aiii. Explain how overdominance normally occurs among organisms. **(4 marks)**

1bi. To genetically modify a plant, what must the breeder do and why? **(4 marks)**

1bii. What is Inbreeding depression and how is it caused? **(4 marks)**

1biii**.** What is self-incompatibility and how is it important in plant breeding? **(4 marks)**

2ai. What factors determine the size of the chromosome? **(2 marks)**

2aii. Why are chromosomes not visible under the light microscope during the interphase stage? **(2 marks)**

2bi. Why is conventional or classical breeding said to be a cyclical process? **(4 marks)**

2bii. Mention and explain the two (2) hypotheses to explain hybrid vigor. **(7 marks)**

3ai. What are the practical applications of Inbreeding Coefficients (F) in plant breeding? **(3 marks)**

3aii. Why is domestication of wild plants important. **(4 marks)**

3bi. Give reasons why breeding for disease resistance requires continual effort. **(5 marks)**

3bii. When is a resistant gene said to be stable? **(3 marks)**

4ai. Explain coefficient of inbreeding (F) **(3 marks)**

4aii. What is the determining factor of rate of inbreeding **(3 marks)**

4bi. In genetics, when is a strain regarded as an "inbred strain"?**(3 marks)**

4bii. Mention the plant families where gametophytic self-incompatibility (GSI) have been reported. **(6 marks)**

5ai. Mention some of the factors that may favour self-compatibility (SC). **(5 marks)**

5aii. What role does self-incompatibility play in the evolution of plants? **(3 marks)**

5bi. What is the difference between gametophytic and sporophytic self-incompatibility? **(3 marks)**

5bii. When is environmentally induced restoration of cytoplasmic male sterility said to occurred? **(3 marks)**

6ai. Define male sterility and cytoplasmic male sterility. **(4 marks)**

6aii. Mention at least eight (8) farm and domestic autogamous plants that you know. **(3 marks)**

6bi. What are the social conditions that heighten the health risk of populations? **(4 marks)**

6bii. Define host resistance and state its causes (4 marks)