



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**  
**FACULTY OF SCIENCE**  
**Department of Pure and Applied Sciences**

**2021\_2 EXAMINATION**

**BIO309: PLANT BREEDING**

**TIME: 1½ HOURS**

**CREDIT UNIT: 1**

**INSTRUCTIONS: Answer question ONE (1) and any other THREE (3) questions**

- 1a. Explain the nature of Polytene chromosomes (12 marks)
- 1b. Write on self-fertilization as a form of inbreeding (10mks)
- 1c. Given that the following organisms have the given number of somatic chromosomes, state the number of gametic chromosomes present in the organisms (3 marks):
- |                   |    |
|-------------------|----|
| Tomato            | 24 |
| Rice              | 24 |
| Wheat             | 42 |
| Onion             | 16 |
| Maize             | 20 |
| <i>Drosophila</i> | 8  |
- 2 Using cytological principle of plant breeding, explain the chromosome morphology under the following;
- (i) Centromere (7 marks)
  - (ii) Chromomere (8marks)
- 3a. Discuss the effect of heterosis in domestic animals (10 marks)
- 3b Outline the Selection process of cross-pollinated crops (5marks)
- 4a. Discuss the use of Clone in plant breeding (9 marks)
- 4b. Account for the existence of secondary constriction in chromosomes (6 marks)
- 5a. Expatriate on the role of cytoplasmic male sterility in hybrid production (9 marks)
- 5b. Explain the RNase mechanism of Gametophytic self-incompatibility (6marks)