



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**  
**FACULTY OF SCIENCE**  
**Department of Biological Sciences**  
**2023\_1 POP EXAMINATION**

**COURSE CODE: BIO402 CREDIT: 2 UNITS**

**COURSE TITLE: CYTOGENETIS OF PLANTS**

**TIME ALLOWED: 2 HOURS**

**INSTRUCTION: ANSWER NUMBER ONE (1) AND ANY OTHER TWO (2) QUESTIONS**

- 1a. List the four (4) types chromosomes based on the location of centromere (4 marks)
- b. Describe how DNA is organized into chromatin (6 marks)
- c. What are the significance of chromosome packaging? (6 marks)
- d. In a Tabular form distinguish Heterochromatin from Euchromatin (6 marks)
- e. Briefly discuss the contributions of the following scientists to the development of Cytogenetics: (8 marks)
- i. Robert Brown ii. Wilhelm Roux iii. Theodor Boveri
- 2a. Give a detailed description of satellite chromosomes (8 marks)
- b. Write briefly on the following:
- i. Karyotypes and idiograms (6 marks)
- ii. Functions of telomeres (6 marks)
- 3a. What do you understand by partner exchange? (2 marks)
- b. Differentiate between Aneuploidy and Euploidy under the following headings: definition, types of variations, variations, occurrence, causes and role (5 marks)
- c. Give a cytological reason why Banana plant cannot propagate by seeds (6 marks)
- d. With the relevant examples, distinguish between Interspecific hybrid and Intergeneric hybrid (7 marks)
- 4a. What is polyploidy? (2 marks)
- b. Mention five (5) advantages of polyploidy (6 marks)
- c. Explain the following types of chromosomal changes:
- i. Deletion (4 marks)
- ii. Translocation (4 marks)
- iii. Duplication (4 marks)
- 5a. Outline four (4) reasons why polyploidy is more common in plants than in animals (4 marks)
- b. Enumerate the principles of chromosome theory of inheritance as postulated by Edmund Beecher Wilson (4 marks)
- c. Describe the shapes of chromosomes during anaphase period of cell division (5 marks)
- d. Write a short note on inversion (4 marks)