



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:
i. Robert Brown ii. Wilhelm Roux iii. Theodor Boveri **(8 marks)**

- 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)**