



**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**

**COURSE CODE: BIO402**

**COURSE TITLE: CYTOGENETIS OF PLANTS**

**CREDIT UNIT: 2**

**TIME ALLOWED: 2 HOURS**

**INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER THREE QUESTIONS**

- 1 a. Outline the evolutionary significance of gene duplication (5 marks)  
b. Explain how monoploids achieve fertility (6 marks)  
c. An organism has diploid chromosome number 28. How many chromosomes would you expect in the:
  - i. monosomic
  - ii. trisomic
  - iii. nullisomic
  - iv. tetrasomic
  - v. triploid
  - vi. autotetraploid(Show how you arrive at each answer) (14 marks)
  
- 2 a. Draw a well labeled metaphase chromosome (7 marks)  
b. Explain chromosome deletion with emphasis on its different types (8 marks)
  
- 3 a. Explain aneuploidy? (6 marks)  
b. Describe Raphanobrassica? (9 marks)
  
- 4 a. List and compare the two types of chromatins. (6 marks)  
b. Write precisely on satellite chromosomes (9 marks)
  
- 5 a. Write concisely on chromosome translocation based on consequences (6 marks)  
b. A diploid plant species A having  $2n = 24$  formed hybrid with another species B with  $2n = 18$ . If the resulting hybrid doubles its chromosome to give an allotetraploid, describe the stages involved in formation of the allotetraploid showing the chromosome numbers and fertility status at every stage using chart only. (9 marks)