



NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
Department of Biological Sciences
2022_2 EXAMINATION

COURSE CODE: BIO402

COURSE TITLE: PHYTOGENETICS OF PLANTS

CREDIT: 2 units

TIME ALLOWED: 2 Hours

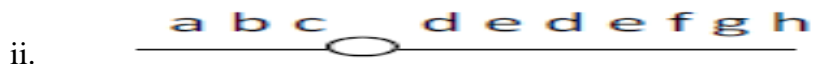
INTRUCTION: Answer question ONE (1) and any other TWO (2) questions

- 1a. Outline the advantages of polyploidy. 5 Marks
1b. Account for how Cytogeneticists demonstrate chromosome size 5 Marks
1c. Write a note on Autopolyploidy in plants 5 Marks
1d. Describe the term Allopolyploidy with clear examples 5 Marks
1e. Explain how Scientists produced monoploid plants. 10 Marks
- 2a. List six (6) plants in which spontaneous monoploid can be found 3 Marks
2b. Discuss meiotic behaviour in monoploids 6 Marks
2c. Enumerate the five (5) advantages of polyploidy 5 Marks
2d. Theodore Boveri's experiment contributed immensely to chromosome theory of Inheritance. Discuss 6 Marks
- 3a. Outline the role of Wilhelm Roux in the development of Cytogenetics. 4 Marks
3b. Write a comprehensive note on physical mutagen 8 Marks
3c. 'Polyploidy is a blessing in disguise among plants that exhibit it'. Discuss 8 Marks
- 4a. a. Identify the following chromosomal aberration found in cytological examination of the chromosomes of a plant species in a particular population (i) **ABC.DE to ACB.DE** (ii) **ABC.DE to ABD.CE** 2 Marks
4b. A normal chromosome has the following gene sequence (0 = centromere).



Gamma-irradiation of the organism produced the following types of chromosomes:





2 Marks

What type of chromosomal aberration occurred in each case?

4c. Define Cytogenetics

2 Marks

4d. Classify chromosomes based on the number of centromeres.

14 marks

5a. Define mutagens

2 Marks

5b. Outline the different types of inversion mutation

3 Marks

5c. Mention four (4) causes of Aneuploidy

4 Marks

5d. Satellite chromosomes do exist in nature in a number of organisms. Discuss

5 Marks

5e. Give a detailed description of the term inversion mutation

6 Marks