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Daffodil International University

Department of Agricultural Science
Faculty of Agriculture
BSc. in Agricultural Science
Final Examination-Summer 2026

Course Code: 0818-2201 **Course Title: Genetics and Plant Breeding -I (Principles of Genetics and Cytogenetics)**
Level and Term: L-2, T-2 **Section: 251 (A & B)** **Course Teacher Initials: MAS & MAR**
Time: 2 Hr **Total Marks: 40**

Splitting any answer is strictly prohibited

1	(a)	Explain the key events of pachytene and anaphase I with proper diagram.	(PLO1,CLO1, C2)	5
	(b)	Explain the significance of meiosis in sexually reproducing organisms.	(PLO1,CLO1,C2)	3
2	(a)	Define mutation and mutagen. Mention the characteristics of mutation.	(PLO2,CLO2,C1)	5
	(b)	List different types of mutagens.	(PLO2,CLO2,C1)	3
3	(a)	In a plant, red flower color is incompletely dominant over white flower color. Apply the principle of incomplete dominance to determine the phenotypic and genotypic ratio of the F_2 generation from a cross between red-flowered and white-flowered plants.	(PLO1,CLO3,C3)	5
	(b)	Apply the concept of chromosomal translocation using two non-homologous chromosome segments and show how gene arrangement changes after segment exchange.	(PLO2,CLO3,C3)	3
4	(a)	A diploid plant has 2n = 6 chromosomes (B1B1B2B2B3B3). Apply the concept of aneuploidy to show the chromosome number of monosomic, nullisomic, and trisomic conditions.	(PLO2,CLO4,C3)	5
	(b)	A diploid organism has lost one chromosome from a homologous pair. Identify the condition, write its formula, and mention cytogenetic consequence.	(PLO1,CLO4, C3)	3
5	(a)	Analyze the F_2 phenotypic classes of a dihybrid cross involving duplicate dominant genes and explain how the ratio 9:3:3:1 is modified into 15:1.	(PLO5,CLO3,C4)	5
	(b)	Diagrammatically show the relationship among *Brassica* sp.	(PLO1,CLO5,C4)	3