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Daffodil International University

Department of Genetic Engineering and Biotechnology
Faculty of Health and Life Sciences
B. Sc. (Hons.) in Genetic Engineering and Biotechnology
Final Examination Spring 2026

Course Code: 0512-2103 | **Section: 251 (A+B)** | **Course Title: Cytology**
Level and Term: L-2, T-1 | **Course Teacher Initials: DSR**
Time: 02 Hours | **Total Marks: 40**

			Marks
1	(a)	Explain the concept of protoplast fusion and discuss its application in plant cytology and genetic improvement.	[CLO1, PLO2, C2] 4.0
	(b)	Discuss numerical chromosomal abnormalities, including polyploidy, trisomy, monosomy, and the diploid state.	[CLO2, PLO1, C6] 4.0
2	(a)	Analyze structural chromosomal alterations such as deletion, inversion, and duplication, and their effects on genetic balance.	[CLO2, PLO1, C4] 4.0
	(b)	Evaluate the significance of chromosomal rearrangements in altering gene order and expression, and their implications in biology.	[CLO3, PLO1, C5] 4.0
3	(a)	Describe how ISH and H&E staining are used to study cells and tissues, highlighting their distinct approaches.	[CLO3, PLO4, C6] 4.0
	(b)	Compare ICC and IHC in terms of their principles and applications in protein detection.	[CLO3, PLO3, C4] 4.0
4	(a)	Explain the composition and function of PBS, emphasizing how its components maintain physiological conditions in cytological experiments.	[CLO3, PLO2, C2] 4.0
	(b)	Design a comparative framework illustrating the processes of spermatogenesis and oogenesis, highlighting their key stages, outcomes, and biological significance.	[CLO2, PLO2, C6] 4.0
5	(a)	Explain the terms mitosis and meiosis and state why are they important in multicellular organisms?	[CLO1, PLO1, C2] 4.0
	(b)	Describe the stages of Mitosis and Meiosis, and differentiate between the two processes.	[CLO2, PLO2, C6] 4.0