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 Fall 2025

Course Code: 0512-1201
Level and Term: L1, T2
Time: 2 Hours

Section: 252 (A+B)

Course Title: Principles of Genetics
Course Teacher Initials: AR
Total Marks: 40

Splitting any answer is strictly prohibited

				Marks
1.	(a)	Define multiple allelism and discuss its features.	[CLO3, PLO7, C6]	2.5
	(b)	Illustrate the Mendelian inheritance pattern between homozygous agouti and heterozygous Himalayan rabbits.	[CLO2, PLO2, C2]	3.5
	(c)	Distinguish between a gene and an allele.	[CLO1, PLO1, C4]	2.0
2.	(a)	Define linkage group. Outline the factors that affect linkage strength.	[CLO4, PLO2, C2]	3.0
	(b)	Why is recombination frequency important in chromosome mapping?	[CLO4, PLO2, C1]	2.0
	(c)	List the genes and their traits in linkage maps of *Drosophila* chromosomes 1 and 2.	[CLO4, PLO2, C4]	3.0
3.	(a)	Explain the process of bacterial conjugation mentioning importance.	[CLO3, PLO7, C2]	4.0
	(b)	Discuss mtDNA and write its role regarding male sterility in plants.	[CLO3, PLO7, C6]	4.0
4.	(a)	What is sex determination? Apply the cytological basis of sex determination in humans.	[CLO4, PLO2, C3]	4.0
	(b)	Explain different types of cytological sex-determination processes.	[CLO4, PLO2, C5]	4.0
5.	(a)	What is extrachromosomal inheritance? Classify cytoplasmic inheritance with examples.	[CLO3, PLO7, C4]	3.0
	(b)	Compare between cytoplasmic inheritance and nuclear inheritance.	[CLO3, PLO7, C5]	2.0
	(c)	Why do variegated branches show green, white, or variegated offspring? Justify.	[CLO3, PLO7, C1]	3.0