



Department of Genetic Engineering and Biotechnology  
Faculty of Health and Life Sciences  
B. Sc. (Hons.) in Genetic Engineering and Biotechnology  
Final Examination Summer 2025

Course Code: 0512-1201  
Level and Term: L-1, T-2  
Time: 2 hours

Section: 251 A, B

Course Title: Principle of Genetics  
Course Teacher Initials: MZA  
Total Marks: 40

Splitting any answer is strictly prohibited

			Marks
1	(a) Define independent assortment and explain conditions where it does not occur in human genes.	[CLO2, PLO1, C1]	4
	(b) What are complete linkage and incomplete linkage.	[CLO3, PLO3, C1]	4
2	(a) Illustrate the process of mitochondrial DNA replication with a labeled diagram.	[CLO6, PLO1, C2]	5
	(b) Justify the statement – “compartmentalization of a transgene may be necessary in cells”.	[CLO3, PLO3, C3]	3
3	(a) Explain the two methods of mitochondrial transformation.	[CLO3, PLO3, C5]	5
	(b) Provide one of the examples of chromosomal DNA manipulation and analyze its outcome.	[CLO4, PLO3, C2]	3
4	(a) Explain the clinical features of Kearns-Sayre Syndrome.	[CLO1, PLO1, C3]	2
	(b) Differentiate between linkage and crossing over.	[CLO3, PLO3, C1]	3
	(c) Which part of DNA control gene expression in A cell? Discuss.	[CLO6, PLO4, C2]	3
5	(a) Explain the mechanism of sex determination in butterflies.	[CLO1, PLO1, C2]	5
	(b) Do you think hormonal imbalance can determine sex in a specie? Show your reasons	[CLO1, PLO1, C5]	3