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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 Summer 2026

Course Code: 0512-1301 **Course Title:** Basic Biochemistry
Level and Term: L1, T3 **Section: 253 (A+B)** **Course Teacher Initials:** DMI & AR
Time: 2 Hours **Total Marks:** 40

Answer the Following Questions: Marks

1	(a)	Define an essential amino acid. Provide the structures of three essential and three non-essential amino acids.	[CLO2, PLO1, C1]	4.0
	(b)	Elaborate the physical and chemical properties of amino acids. Explain how a peptide bond is formed between two amino acids with a suitable chemical reaction.	[CLO2, PLO1, C2]	4.0
2	(a)	Define and classify proteins based on their structure. Illustrate the major structural levels of protein with suitable diagram.	[CLO2, PLO2, C4]	4.0
	(b)	Describe denaturation and renaturation. Explain the major functions of proteins.	[CLO2, PLO1, C6]	4.0
3	(a)	Define nucleoside and nucleotide. Illustrate the structural features of a nucleotide with a suitable figure.	[CLO2, PLO1, C5]	4.0
	(b)	What is DNA? Analyze the major features of the Watson–Crick double-helix model of DNA with a suitable diagram.	[CLO2, PLO2, C3]	4.0
4	(a)	What is a nitrogenous base? Classify nitrogenous base and explain complementary base pairing according to Chargaff's rules.	[CLO3, PLO1, C2]	4.5
	(b)	Define and classify RNA. Analyze the functions of major types of RNA that contribute to protein synthesis.	[CLO3, PLO2, C4]	3.5
5	(a)	Define and classify hormones based on their chemical nature, and state their major functions.	[CLO4, PLO2, C1]	4.0
	(b)	What is vitamin? Classify vitamins based on solubility. Evaluate the importance of vitamins in maintaining normal body functions.	[CLO4, PLO2, C5]	4.0