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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
Midterm Examination Fall 2026

Course Code: 0512-2201 **Course Title: Biofertilizer and Renewable Energy**

Level and Term: L-2-T-2 **Section: 252 (A+B)** **Course Teacher Initials: KMH**

Time: 1 Hour 30 Minutes **Total Marks: 25**

				Marks
1	(a)	What is biofertilizer? Classify biofertilizers based on their functional types citing examples.	[CLO1, PLO2, C4]	2.5
	(b)	Illustrate 'Legumes: Nodulation and Crop Specificity' and 'Field Application Methods'.	[CLO1, PLO2, C2]	2.5
2	(a)	What are the sources of nitrogen in agricultural soil? Illustrate the nitrogen cycle.	[CLO2, PLO2, C2]	2.5
	(b)	Explain how the soil and climatic factors affect nitrogen fixation. Illustrate 'symbiotic nitrogen fixation'.	[CLO1, PLO2, C2]	2.5
3	(a)	State the methods used to investigate the mechanism of action of nitrogenase. Outline the integrated mechanism of biological nitrogen fixation.	[CLO1, PLO2, C2]	2.5
	(b)	Mention the procedure for the isolation and establishment of a pure culture of *Azotobacter*. List the molecular and genomic methods used to identify *Azotobacter*.	[CLO2, PLO2, C4]	2.5
4	(a)	Explain the methods used to identify *Frankia* and evaluate its symbiotic effectiveness.	[CLO1, PLO2, C5]	2.5
	(b)	Organize the inoculant formulations and carrier selection procedures for *Rhizobium*.	[CLO2, PLO2, C3]	2.5
5	(a)	Explain the procedures for strain selection and culture maintenance in *Azotobacter*. List the methods of soil application and the establishment of *Azotobacter*.	[CLO1, PLO2, C2]	2.5
	(b)	Justify the use of *Azospirillum* as a biofertilizer. Discuss the methods used for strain selection and inoculant design in *Azospirillum*.	[CLO1, PLO2, C5]	2.5