United International University

School of Science and Engineering

Final Examination; Year 2024; Trimester: Fall

Course: BIO 3105/3107; Title: Biology for Engineers/Biology;

Sec: All

Full Marks: 40; Time: 2 hours

There are Five Questions, 1, 2, and 3 are mandatory to answer, and answer 4 or 5 (anyone).

1.	A. Suppose, you want to produce a recombinant protein. Illustrate the workflow.	4	CO4
	B. In ecology, two parameters are used to measure changes in ecosystems, resistance and resilience. Define them.	2	CO1
	C. Is there any connection between food and mental health? If yes, then discuss them.	2	CO3
	D. Immune system becomes overactive in some people. Interpret the reasons behind overactivity.	2	CO2
2.	A. Consider you have a DNA sample of 1500 bp. How can you amplify the DNA using PCR? Construct the outline of this process.	4	CO3
	B. Non-communicable diseases (NCDs) are increasing day by day. Explain how healthy diets can reduce the risk of NCDs.	2	CO2
	C. Recently there is an outbreak of HMPV infections. Describe how vaccination can prevent this infection?	4	CO4
3.	A. DDT was a commonly used pesticide but later it was banned. Demonstrate the reason behind the consequences of DDT in food web with illustration.	4	CO4
	B. Bangladesh is an agricultural country. How can you apply recombinant DNA technology in agricultural sector?	2	CO2
	C. Explain the concept of food pyramid with diagram.	2	CO1
	D. List the ways in which you can make a competent host.	2	CO1
4.	A. How can we separate DNA according to its size. Summarize the technique that you will use.	5	CO4
	B. For example, any bacteria are invaded in our body. Justify how our immune system can produce antibody against the bacteria.	5	CO3
5.	A. Do you propose any changes in diet for a 95 kg 130 cm woman? Calculate the BMI and suggest possible changes you want to recommend in diet.	5	CO2
	B. With a diagram, evaluate the energy flow between trophic levels.	5	CO1

CO1: Describe different biological quantities.
CO2: Apply the knowledge of biological systems in a real-life problem.
CO3: Design several biological systems with constraints.
CO4: Explain several procedures for solving biological systems within constraints.