United International **University**

School of Science and Engineering

Final Examination; Year 2023; Trimester: Summer
Course: BIO 3105; Title: Biology for Engineers; Sec: A-C
Full Marks: 40; Time: 2 hrs

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

1.	(a) Name the enzymes are used for isolation of DNA.	2	CO1
	(b) Differentiate the food web and the food chain.	2	CO1
	(c) GMO stands for what and define it.	2	CO1
	(d) Differentiate autotrophs and heterotrophs.	2	CO1
	(e) Name the components of immune system.	2	CO1
2.	(a) Select the ways how homeostasis is maintained body temperature is below the set point.	4	CO2
	b. Apply your knowledge why normal BMI value is not used for muscle builders?	3	CO2
	(c) Show how the primers, nucleotide and Taq works for amplification of DNA.	3	CO2
3.	(a) People are now consuming more foods high in energy, fats, free sugars and salt/sodium leading to NCD, propose a healthy diet to prevent NCD.	3	CO3
	(b) Integrate the producer and consumer effect in ecosystem.	3	CO3
	(c) Organize your clarification how to separate out different sized DNA fragments, explain.	4	CO3
4.	(a). Interpret the equations for chemosynthesis and photosynthesis. Which one of these two do you think vital for ecosystems on earth? Give reasons in brief.	5	CO4
	(b) Explain the relationship between food and mental stress. Please share your thoughts on what actions we should take in this regard.	5	CO4
5.	(a) Discuss the relationship of vaccination with primary and secondary response.	5	CO4
	(b) Suppose you have a restriction enzyme that has a recognition sequence GCCG. Demonstrate the rDNA for a given sequence of one strand as below show in a pictorial view (You need to complete the DNA with a complementary strand before starting the process). ATAACGATAGCCGTATTATGCAATGCATTACGAGCCGTATAAT	5	CO4

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.