United International University

School of Science and Engineering

Mid-term Examination; Year 2022; Trimester: Fall
Course: BIO 3105; Title: Biology for Engineers; Sec: A-C
Full Marks: 30; Time: 1 hr 45 mins

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

1.	(a) Define how the Ecosystems and evolution are intertwined.	2	CO1
	(b) Describe the differences between prokaryotic and eukaryotic cells.	2	CO1
	(c) Describe the characteristics of genetic code.	2	CO1
	(d) Describe what happened in the S phase in meiosis 2.	2	CO1
2.	(a) Suppose you have a piece of land where you are supposed to grow vegetables. Can you design a biorobot that can potentially help you to reduce the expenditure on manpower? Is that possible to use your expertise in this case?	3	CO2
	(b) The Chestnut mane and tail in horses are dominant traits and Flaxen mane and tail are the recessive traits. What would be the percentage of Flaxen mane and tail two generations after if the mating happens between two pure breeds of the above mentioned traits?	3	CO2
	(c) Do you think RNA could be your genetic material? Give logic behind your answer.	2	CO2
3.	(a) Can you design a project in the field of Tissue Engineering using your own background? Explain briefly about the project and how you can implement your expertise there.	3	CO3
	(b) Short height and abnormal formation of arms are two symptoms of down syndrome. Trisomy is observed in some plants having a number of petals more than usual. From your understanding the classifications of chromosomal abnormalities comment on how you would differentiate the above mentioned symptoms.	3	CO3
	(c) Do you think nutrients are transported across cell membranes? If so, a brief description will be sufficient for the answer including the methods and means for transportation.	2	CO3
4.	(a) Explain from your point of view how you would define yourself, an engineer, or a scientist.	3	CO4
	(b) Explain why some of the organelles are named suicidal bag and some are power houses.	3	CO4
5.	(a) Explain the processes Transcription and Translation, and describe the significance mRNA tRNA in these processes.	3	CO4
	(b) Explain why there is no interphase in meiosis 2. Differentiate the metaphase of meiosis 1 and mitosis.	3	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.