Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Mid Term Examination, Fall 2024

Course Code: CSE115, Course Title: Introduction to Biology and Chemistry for Computation

Level: 1 Term: 1 Batch: 67

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	After getting admitted to CSE, Mohammad went to meet his college teachers. His College Chemistry teacher was so delighted to hear that he will study cse and he said to him, "Have you heard about computational chemistry? Using my theoretical knowledge and your programming knowledge we can do something big! "			**CO1**
	a)	Using your knowledge on computational chemistry, **Describe** some of the applications of computational chemistry.	**[3]**	
	b)	"Bioinformatics is the interdisciplinary field where computer science, mathematics, physics, and biology are merged" **Express** your understanding of this quote with the necessary diagram.	**[5]**	
2.	Rafi is a chemical engineer working in a large pharmaceutical company, PharmaTech Inc. The company is in the process of developing a new drug to combat a recently discovered virus. The initial stages of drug development have been challenging due to the complexity of the virus's protein structure. Rafi's team is considering using computational chemistry tools to model the interactions between potential drug molecules and the virus's proteins. Additionally, the manufacturing plant where the drug will be produced is equipped with a Distributed Control System (DCS) to ensure efficient and safe operations			**CO2**
	a)	**Evaluate** the role of computational chemistry in overcoming the challenges faced by PharmaTech Inc. during the drug development process.	**[5]**	
	b)	**Determine** how a distributed control system (DCS) enhances the efficiency and reliability of industrial processes compared to a centralized control system? explain how it optimizes control and monitoring functions within these contexts with appropriate diagrams.	**[5]**	
3.	Suppose you are in a crime scene, trying to find out the identity of the criminal. Your plan is to find out his/her identity through DNA sequence matching.			**CO1**
	a)	**Express** your idea about the things that you will look for in the scene that will help you to find out the DNA sequence of the criminal.	**[2]**	
	b)	**Explore** the above mentioned method step by step with necessary illustrations that you will use.	**[5]**	