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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science and Engineering
Midterm Examination, Fall-2025
Course Code: CSE225, Course Title: Data Communication
Level: 2 Term: 2 Batch: 66

Time: 1 Hour and 30 Minutes 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	a)	Daffodil International University is a technologically advanced institution with several well-equipped laboratories. In one such modern lab, named the Robotics Lab, multiple high-configuration computers are set up. Each computer is connected to a central networking device that manages the data flow between them. However, these computers are not allowed to communicate within themselves. Through this setup, every computer can share files with others and also access a common printer connected to the network. **Analyze** the scenario and justify your answers 1. What type of network topology is being used in the Robotics Lab? 2. Why do you think this topology was chosen for this setup? 3. What could be the possible disadvantages of using this topology in such a lab environment?	3	CO1
	b)	Assume ten devices are arranged in a mesh topology. How many cables are needed in total? How many ports are needed for each device? **Analyze** the impact if one connection gets disconnected.	2	
2	a)	**Identify** the following functions to the appropriate OSI model A. It uses a mechanism to recognize duplicate frames. B. Ensures reliable transmission of data C. Flow control at this layer is performed end to end rather than across a single link. D. Data translation, encode and conversion. E. It allows a user to log on to a remote host. F. It allows a process to add a checkpoint.	3	CO2
	b)	**Compare and contrast** Encapsulation and Decapsulation in terms of peer to peer model. Draw figure if appropriate	2	

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3	a)	**What** will be the attenuation if a signal travels through a transmission medium and its power is reduced to one-half.	2	CO3
	b)	**What** is the transmission time of a packet sent by a station if the length of the packet is 1 million bytes and the bandwidth of the channel is 200 Kbps?	3	
4	a)	**Implement** the necessary calculations to find the capacity and signal level for a signal operating between 2 MHz and 4 MHz, given that SNR (in dB) is 50. F	3	
	b)	**Explain** different types of noises that might cause transmission impairment.	2	
5	a)	**Analyze and Draw** the Line Coding of the bits 100101010110: I. Differential Manchester II. NRZ (I) III. MLT-3	3	
	b)	**What** is the maximum data rate of a channel with a bandwidth of 200 KHz if we use four levels of digital signaling? B	2	