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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science and Engineering

Final term Examination, Spring-2024

Course Code: CSE225, Course Title: Data Communication

Level: 2 Term: 2 Batch: 63

Time: 2:00 Hrs **Marks: 40**

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)***	Which of the modulation techniques vary its phase to determine 0 and 1? What are the possible advantages, limitations and applications of such modulation?	[4]	CO3
	b)	Calculate the bit rate for the given baud rate and type of modulation. a. 4000 baud, FSK b. 4000 baud, ASK c. 4000 baud, BPSK d. 4000 baud, 16-QAM	[4]	
	c)	Calculate the bandwidth for the following situations if we need to modulate a 10-KHz voice. a. AM b. PM (set β =5)	[2]	
2.	***a)***	Suppose, you want to multiplex and send several light waves within the optical fiber simultaneously. Which type of multiplexing would you choose? Justify your logic with appropriate figure.	[3]	CO3
	b)	Why do we need data rate management to achieve multiplexing? What kind of changes should be imposed in input data rates to achieve multiple slot multiplexing? Explain your understanding with appropriate figure.	[3]	
	c)	We need to use synchronous TDM and combine 10 digital sources, each of 100 Kbps. Each output slot carries 1 bit from each digital source, but one extra bit is added to each frame for synchronization. Answer the following questions: a. What is the size of an output frame in bits? b. What is the output frame rate? c. What is the duration of an output frame? d. What is the output data rate?	[4]	
3.	***a)***	Suppose, Mr. Rahim and Mr. Karim planned to communicate over a secured channel. Mr. Rahim wanted to send the following bits in binary 110, 1111, 10, 1000, 101. Calculate the checksum.	[4]	CO4
	b)	Mr. Jamal and Mr. Kamal planned to use CRC to secure their transmitted bits. Therefore, they both planned to use 1011_2 as a private key. If Mr. Jamal wants to send the following bits 110101_2, what would be their CRC?	[4]	
	c)	Suppose you have the following message bits: 1110010 1010101 1010001 Discover your transmitted bits if you use 1-D (even) parity.	[2]	
4.	***a)***	Persistent vs Non-persistent; Which of the following CSMA strategy would you choose to reduce collision and why? Justify your logic with proper diagram?	[3]	CO4
	b)	Why Token passing algorithm is considered as Controlled Access Protocol? Explain your understanding with proper diagram.	[3]	
	c)	Suppose you have 4 stations (A, B, C, and D). A, C are sending 0, B is silent and D is sending 1. Demonstrate your calculation and discover the CDMA multiplexing values using Walsh table.	[4]	