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Daffodil International University

Faculty of Science & Information Technology

Final Examination, Spring 2023

Course Code: CSE225: Course Title: Data Communication

Level: 2 Term: 2 Batch: 60

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)***	Uneven input data rates are one of the issues that TDM has to deal with. However, both multiple-slot and pulse stuffing multiplexing are capable to even the data rates but in a different way. Therefore, compare between multiple-slot and pulse stuffing TDM with appropriate figure.	**[2]**	**CO3**
	b)	Two channels, one with a bit rate of 200 kbps and another with a bit rate of 210 kbps, are to be multiplexed using pulse stuffing TDM with no synchronization bits. Answer the following questions: a. Examine the size of a frame in bits. b. Examine the frame rate. c. Examine the duration of a frame. d. Examine the data rate.	**[4]**	
	c)	The practice of multiplexing signals from lower-bandwidth lines to higher-bandwidth lines has long been used by telephone companies to increase the efficiency of their infrastructure. Many switched or leased lines can be joined in this fashion into fewer but larger channels. Therefore, analyze the analog hierarchy of a telephone company with proper flow diagram. Besides, discover the bandwidth and guard band for each level.	**[4]**	
2.	***a)***	The single-bit error differs from a burst error. Analyze the statement with appropriate figure.	**[2]**	**CO4**
	b)	Discover the Hamming distance for each of the following code words? a. d (10000, 00000) b. d (10101, 10000) c. d (00000, 11111) d. d (00000, 00000)	**[2]**	
	c)	Suppose, your divisor is $x^3 + x + 1$ and dividend is $x^3 + 1$. Inspect the CRC.	**[3]**	
	d)	Compare your obtained CRC (from 2.c) to prove that there is no error in destination portion.	**[3]**	
3.	***a)***	Compare Persistent and Non-persistent CSMA strategies with appropriate figure.	**[3]**	**CO4**
	b)	Which of the CSMA (CSMA/CD or CSMA/CA) is used in wireless LAN? Analyze that with proper figure.	**[3]**	
	c)	Suppose you have 4 stations (A, B, C and D). B, C are sending 0, D is sending 1 and A remains silent. Discover the CDMA multiplexing values using Walsh table.	**[4]**	
4.	***a)***	Analyze the Token passing algorithm with appropriate figure.	**[5]**	**CO4**
	b)	Make use of your knowledge to prove that a router is capable to replace a switch in a network.	**[2]**	
	c)	In the reservation method, "a station needs to make a reservation before sending data". Construct the logic to prove the statement.	**[3]**	