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Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S,FE) Examination January 2022 (2015 Scheme)

Course Code: CS307

Course Name: DATA COMMUNICATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		List out the characteristics required for defining a periodic analog signal with definition of each term.	(3)
2		Draw the time domain and frequency domain plot for a sine wave of amplitude 5 V and frequency 3 Hz.	(3)
3		Explain the principle used in optical fibre communication. List out the different types of fibres used.	(3)
4		Draw and explain the frequency spectrum required for wireless transmission.	(3)

PART B

Answer any two full questions, each carries 9 marks.

5	a)	How do the communication models differ in data transmission? Explain with examples.	(6)
	b)	Define bandwidth in terms of bits per second and in terms of Hz.	(3)
6	a)	Compare analog and digital transmission? Which one is better? Justify your answer.	(6)
	b)	How will you determine the signal level required for achieving maximum capacity of a channel?	(3)
7		Compare the different wireless propagation methods used in unguided media.	(9)

PART C

Answer all questions, each carries 3 marks.

8	What are the steps involved in digital data to digital signal encoding? Explain.	(3)
9	Define sampling theorem. What is its significance?	(3)
10	How do you maintain data disparity in time division multiplexing? Explain.	(3)
11	What do you mean by multiple access of a channel? Name the methods used to solve issues related to multiple access.	(3)

PART D

Answer any two full questions, each carries 9 marks.

12	a)	Assuming previous level to be positive, for a data pattern 10101100101, draw the digital wave forms for the following signal encoding techniques: NRZ- L, AMI and Manchester Encoding.	(3)
	b)	Explain pulse code modulation technique with neat diagram and an example.	(6)
13		With a neat sketch, explain frequency division multiplexing.	(9)
14	a)	Differentiate between statistical and synchronous time division multiplexing.	(3)
	b)	Draw the SONET frame format and explain the features of SONET.	(6)

PART E

Answer any four full questions, each carries 10 marks.

15	a)	Differentiate between synchronous and asynchronous transmission.	(5)
	b)	What are the different types of errors occurring in data communication? What do you mean by error control?	(5)
16	a)	Explain how parity check is used in error detection. Assuming an odd parity, derive the code words for the following data: 10111, 01101, 11111	(5)
	b)	Using polynomial division, find the code word for the data pattern 1001101 with a generator 1011.	(5)
17	a)	What do you mean by forward error correction?	(3)
	b)	Define Hamming distance. Find the hamming distance for the following pairs of data: (101010, 111000), (111110, 010101), (111010, 000010) and (110011, 001100) What is the minimum hamming distance required for detecting and correcting 't' errors?	(7)
18		With a neat sketch, explain direct sequence spread spectrum technique.	(10)
19		What is the goal of spread spectrum technique? Explain how frequency spread spectrum technique achieves this goal.	(10)
20	a)	Differentiate between virtual circuit switching and datagram switching.	(5)
	b)	With a neat sketch, describe the structure of a packet switch.	(5)

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