Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: CS307

Course Name: DATA COMMUNICATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		Explain the three most significant transmission impairments.	(3)
2		Express the Time domain and frequency domain representations of a signal with frequencies 0, 8 and 16Hz.	(3)
3		Transmission characteristics of Fibre Optic cable differs from Coaxial cable. How?	(3)
4		For multicast communications which type of wireless transmission waves are suitable? Justify your answer.	(3)

PART B

Answer any two full questions, each carries 9 marks.

5	a)	A telephone line is known to have a loss of 20dB. The input signal power is measured as 0.5W, and the output noise level is measured as 4.5μW. Using this information, calculate the output signal to noise ratio in dB.	(5)
	b)	Find the maximum distance between two antennas for LOS transmission if one antenna is 100 m high and the other is at ground level.	(4)
6	a)	Explain in detail transmission modes of Fibre optic cable?	(5)
	b)	How capacity of a system is determined in the presence of noise? We have a channel with a 1MHz bandwidth. The SNR for this channel is 63. Then calculate channel capacity.	(4)
7	a)	How Nyquist theorem applied for a noiseless channel? We need to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz. How many signal levels do we need?	(5)
	b)	Briefly discuss Line of Sight propagation.	(4)

PART C

Answer all questions, each carries 3 marks.

8		Differentiate between NRZL and NRZI encoding techniques with examples.	(3)
9		Four 1-kbps connections are multiplexed together. A unit is 1 bit. Find (a) The duration of 1 bit before multiplexing, (b) The transmission rate of the link, (c) The duration of a time slot.	(3)
10		Explain the various steps involved in Pulse Code Modulation.	(3)
11		Write short note on CDMA.	(3)

PART D

Answer any two full questions, each carries 9 marks.

12	a)	We have an available bandwidth of 100 kHz which spans from 200 to 300 kHz. What are the carrier frequency and the bit rate if we modulated our data by using ASK with d = 1?	(5)
	b)	Explain SONET frame format?	(4)
13	a)	Draw the Manchester and Differential Manchester encoding schemes for the data 01001100011.	(4)
	b)	Write the importance of Digital carrier system.	(5)
14	a)	A multiplexer combines four 100-kbps channels using a time slot of 2 bits. Show the output with four arbitrary inputs. What is the frame rate? What is the frame duration? What is the bit rate? What is the bit duration?	(5)
	b)	What is the total bandwidth required for frequency modulation. Explain with neat sketch.	(4)

PART E

Answer any four full questions, each carries 10 marks.

15	a)	Compare the characteristics of Synchronous and Asynchronous transmission.	(5)
	b)	The data to be transmitted is given below. If it is send with odd parity, what will be the parity bit generated? a) 11010 b) 000000 c) 01010000 d) 11111 e) 0000110	(5)
16		Using CRC, given the data word 100100 and the divisor is 1101	(10)

i. Show the generation of the code word at sender site

ii. Show the checking of code word at receiver site

17	a)	Calculate the pair wise hamming distance among following pair of code words and find the minimum Hamming distance? a) (10101, 11110,01011) b) (00011110,10101001,10100110,00001110)	(6)
	b)	Define different types of errors occur in data transmission with example.	(4)
18	a)	Why is circuit switching inefficient for transmission of nonvoice data?	(5)
	b)	Discuss the transmission of packets using the datagram approach in packet switching.	(5)
19	a)	Explain the General Model of Spread Spectrum System.	(5)
	b)	Explain direct sequence spread spectrum with neat sketch.	(5)
20	a)	Show the characteristics of Frequency Hopping Spread Spectrum System.	(4)
	b)	Compare the mechanism of space division switch to the mechanism of time division switch?	(6)

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