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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: CS307

Course Name: DATA COMMUNICATION (CS)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

1		Define simplex, half duplex and full duplex transmission mode. Give one example for each.	(3)
2		List and explain different factors which determine the performance of communication in a network?	(3)
3		Write physical and transmission characteristics of Optical Fibre Cable guided transmission media.	(3)
4		What are the advantages of microwave transmission over radio wave transmission? For a parabolic reflective antenna with a diameter of 2m, operating at 12 GHz. Calculate the antenna gain? Given effective area= 56π.	(3)

PART B

Answer any two full questions, each carries 9 marks.

5	a)	(a) Explain time domain and frequency domain concept of a signal in a communication system.	(5)
	b)	List various impairments and explain how they affect information carrying capacity of a communication link?	(4)
6	a)	How does cross talk occurs in twisted pair cables? Give the purpose of CAT5e,CAT6,CAT7 twisted pair cables.	(5)
	b)	Show that doubling the distance between transmission antenna and receiving antenna attenuates the power received by 6dB.	(4)
7	a)	Define Channel Capacity. What key factors affect highest data rate for noiseless channel and noisy channel? Signal to Noise Ratio is often given in decibels. Assume SNR_{db}=36 and the channel bandwidth is 2Mhz. Calculate theoretical channel capacity?	(5)
	b)	Explain following wireless propagation modes (i) Ground wave propagation(ii) Sky wave propagation	(4)

PART C

Answer all questions, each carries 3 marks.

8		Give the significance of delta modulation over pulse code modulation during the process of transforming analog data in to digital signal.	(3)
9		Show the equivalent analog sine-wave pattern of the bit string 00110101 using amplitude shift keying, frequency shift keying andphase shift keying	(3)
10		What are the advantages of using multiplexing in data communication?How does a synchronised time division multiplexer stay synchronized with de-multiplexer on receiving end ?	(3)
11		What type of multiplexing is preferred in optical fibre communication? Justify your answer	(3)

PART D

Answer any two full questions, each carries 9 marks.

12 a) For the bit stream 11000110010,sketch the wave form for each of the code of NRZ-I.NRZ-L, Bipolar-AMI, Pseudoternary, Manchester, Differential Manchester. (5)

b) Explain the modulation technique used in Asymmetric Digital Subscriber Line(ADSL) and cable modems (4)

13 a) With suitable example explain the working principle of Code division multiplexing for CDMA technology. (5)

b) Explain the frame format of Synchronous Optical Network(SONET) for the version SDH. (4)

14 a) State Sampling theorem. With help of suitable diagrams, explain the process of transforming analog data in to digital signal using Pulse Code Modulation technique. (5)

b) How Time division Multiplexing (TDM) handle disparity in the input data rate, if data rate of all input lines are not same? (4)

PART E

Answer any four full questions, each carries 10 marks.

15 a) Explain with suitable diagram, how asynchronous and synchronous connections are used in data communication. (5)

b) Explain major types of noise occur during data transmission, which causes errors. (5)

16 a) Why would you expect a CRC to detect more errors than a parity bit? (5)
For P=110011 and M=11100011, Find CRC.

b) With suitable examples explain sliding window error control mechanism in data communication. (5)

17 a) Give any two reasons why baseband signal cannot be directly transmitted in a wireless system? How Frequency Hopping Spread Spectrum(FHSS) spread the baseband signal for transmission. (5)

b) How does spread spectrum eliminates narrow band interferences? Explain Direct Sequence Spread Spectrum(DSSS) technique. (5)

18 a) What are the different architectural components in public communication network? Explain its working principle. (5)

b) Explain the datagram approach for packet switching network. What is the significance of packet size in packet switching network? (5)

19 a) Given the dataword 1001001111 and the devisor 10111,show the generation of the CRC codeword at the sender site using binary division. (5)

b) Calculate the hamming pairwise distance among following codewords; (5)
i) 00000,10101,01010 ii) 000000,010101,101010,110110

20 a) List four major components of packet switch and write their function (5)

b) With suitable example illustrate working of virtual circuit approach for packet switching (5)

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