Reg. No.

C

B.Tech. Degree III Semester Regular/Supplementary Examination January 2023

CS 19-202-0306 DATA AND COMPUTER COMMUNICATION
(2019 *Scheme*)

Time: 3 Hours

Maximum Marks: 60

Course Outcomes
On successful completion of the course, the students will be able to:

CO1: Explain and calculate digital transmission over different types of communication media.
CO2: Describe the principles of access control to shared media and carry out performance calculations.
CO3: Solve issues in networking by referring to problem solving steps through relevant information by choosing suitable techniques.
CO4: Explain the role of protocols in networking.
CO5: Analyse the services and features of various communication devices.
Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 –Analyze, L5 – Evaluate, L6 – Create
PO – Programme Outcome

PART A
(Answer *ALL* questions)

			(8 × 3 = 24)	Marks	BL	CO	PO
I.	(a)	What is a protocol? What are the key elements of a protocol?		3	L1	1	1
	(b)	Compare IP address and MAC address.		3	L2	1	1
	(c)	Define Nyquist Bit rate. Consider a noiseless channel with a bandwidth of 2500 Hz transmitting a signal with two signal levels. Find the maximum bit rate.		3	L1	1	1
	(d)	Explain frequency division multiplexing.		3	L1	2	1
	(e)	Discuss the need of switching.		3	L1	2	1
	(f)	Discuss the different types of errors in data transmission.		3	L1	2	1
	(g)	Discuss run length encoding. Compress BBBBHHDDXXXXKKKKWWZZZZ using run length encoding.		3	L2	3	3
	(h)	Find the number of cable links required in a fully connected mesh network with 10 computers.		3	L2	4	2,3

PART B

(4 × 12 = 48)

				Marks	BL	CO	PO
II.	(a)	Discuss various transmission impairments and explain how they affect the performance of a communication link?		8	L1	1	1
	(b)	Encode the bit stream 010011 into the following line coding schemes (i) NRZ-L (ii) NRZ-I (iii) Manchester (iv) Differential Manchester.		4	L3	1	3

OR

				Marks	BL	CO	PO
III.	(a)	Explain the various steps involved in Pulse Code Modulation.		6	L1	1	1
	(b)	Compare the characteristics of Synchronous ,Asynchronous and isochronous transmission.		6	L2	1	3

				Marks	BL	CO	PO
IV.		Explain about different transmission medium used in data communication.		12	L1	2	1

OR

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			Marks	BL	CO	PO
V.	(a)	Describe the three phases in a circuit switching operation.	7	L1	2	1
	(b)	Five channels, each with a 100-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10 kHz between the channels to prevent interference?	5	L3	2	3
VI.	(a)	A text is made up of characters a, b, c, d and e with frequencies 11,40, 16,9 and 24 respectively. Find average code length.	5	L3	3	3
	(b)	Using CRC, given the data word 10011101 and the generator polynomial is x^3+1. (i) Show the generation of the code word at the sender site. (ii) Show the checking of code word at the receiver site.	7	L3	3	3

OR

VII.		Write a note on IEEE Ethernet standards.	12	L2	4	1
VIII.		Explain about the different types of connecting devices in computer networks.	12	L2	4	1

OR

IX.		Explain about: (i) Standard Ethernet (ii) Fast Ethernet (iii) Gigabit Ethernet	12	L2	5	1,2,6

Bloom's Taxonomy Levels
L1-42%,L2-31.5%,L3-26.5%

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