BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER : V**
BRANCH: ECE **SESSION : SP/2023**

SUBJECT: EC307 DATA COMMUNICATION

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Explain how the analog data is converted into Digital signal. Write down the advantages of digital transmission over analog transmission.	[5]	1	2
Q.1(b)	Define baud rate. Write down the relationship between data rate and baud rate. Specify the limit of baud rate in Manchester coding. For which bit pattern the minimum and maximum baud rate will come.	[5]	1	3
Q.2(a)	Write down the function of each layer of OSI protocol. Explain how the service primitives are used for interaction between adjacent layers.	[5]	5	3
Q.2(b)	In a CRC scheme, find the frame to be transmitted for the message M = 1010101101 and the generator polynomial P = 110101. Implement the scheme with shift register.	[5]	2	4
Q.3(a)	Draw the frame format of HDLC. Explain the individual block. Explain how the data transparency is achieved in HDLC.	[5]	2	3
Q.3(b)	Explain CHAP in Point to point protocol. Compare it with PAP.	[5]	3	2
Q.4(a)	Implement a synchronous TDM scheme for the following signals: four 4kHz telephone channels, two 20kHz music channel three 7.5kbps digital line one 9.2Kbps digital line. Find the data rate of the multiplexed signals if 3bit ADC is used for conversion of analog to digital signal.	[5]	3	4
Q.4(b)	Justify why asynchronous TDM is called as an intelligent TDM. Give the practical example of asynchronous TDM and explain the mechanism of data transfer.	[5]	3	4
Q.5(a)	A packet switched Network with respective costs for each link marked aside is shown in Figure 1.	[5]	4	3

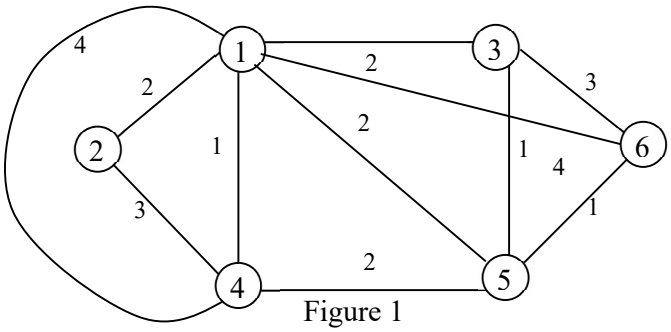

Figure 1

Find the least cost paths for all nodes by Bell Man ford algorithm, considering Node 2 as the source node.

PTO

Q.5(b) In original Arpanet source node-3 routing table before update and delay vector sent to source node from neighboring nodes are given below. Find out the source node routing table after update. [5] 4 3

Destination	Delay	Next node		Delay from Node-2	Delay from Node- 4	Delay from Node- 6
1	8	1		4	2	2
2	12	4		0	5	1
3	0	--		3	4	6
4	5	4		5	0	4
5	10	3		2	2	3
6	4	6		8	3	0
7	14	4		6	2	8
8	12	8		4	5	3
9	3	2		2	8	4

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