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

CLASS: BTECH **SEMESTER : V/ADD**
BRANCH: ECE **SESSION : MO/2025**

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)	I. What is Inter Symbol Interference. How it is caused. It critical for which type of data? II. Find out the relationship between Eb/N_0 and SNR. Write down the condition in which both the value will be same.	[5]	1	2
Q.1(b)	Write down the advantages of digital transmission over analog transmission. Draw the bit pattern of the following bit string 10010101101 for Manchester and Bipolar AMI coding scheme.	[5]	1	3
Q.2(a)	How a confirmed service is rendered between adjacent layers in OSI architecture	[5]	1	3
Q.2(b)	In a CRC scheme, find the frame to be transmitted for the message M = 1010110101 and the generator polynomial P = 110101. Implement the scheme with shift register.	[5]	2	3
Q.3(a)	Draw the frame format of HDLC. Explain how data transparency is achieved in HDLC at transmitter and receiver end.	[5]	3	4
Q.3(b)	Compare between : I Timeout recovery and Reject recovery in HDLC [3] II. Goback-N ARQ and selective reject [2]	[5]	3	2
Q.4(a)	Implement a synchronous TDM scheme for the following signals: three 8kHz analog channels, two 20kHz music channel two 7.5kbps digital line and one 12Kbps digital line. Find the data rate of the multiplexed signals; assume 3-bit PCM words.	[5]	4	3
Q.4(b)	Compare between a. circuit switching, and packet switching. [3] b. Data gram packet switching and virtual circuit packet switching [2]	[5]	4	3
Q.5(a)	A packet switched Network with respective costs for each link marked aside is shown in Figure 1.	[5]	5	2

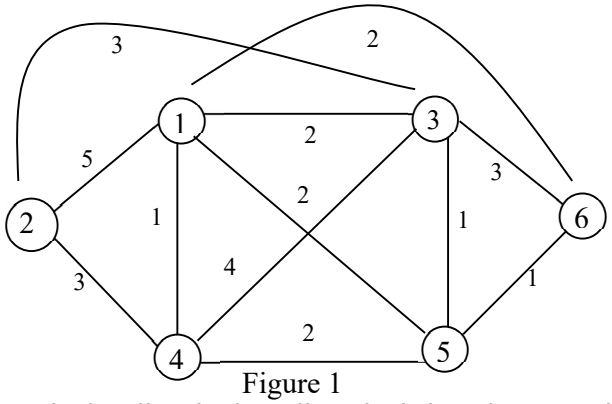

Figure 1

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

PTO

Q.5(b) In original Arpanet source node-2 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] 5 3

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

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