

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

**CLASS: BTECH
BRANCH: ECE**

**SEMESTER : VI
SESSION : SP/2023**

SUBJECT: EC351N 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.
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	CO	BL
Q.1(a) Define Channel capacity. How the channel capacity is related to bandwidth in noisy and noise free environment. The capacity of a channel is required to be 25Mbps. If the bandwidth of the channel is 5MHz estimate the signal-to-noise ratio to achieve the capacity assuming only white thermal noise. [5]	1	2
Q.1(b) In a CRC scheme, find the frame to be transmitted for the message M = 1110101101 and the generator polynomial P = 110101. Implement the scheme with shift register. [5]	1	3
Q.2(a) With suitable diagram compare between the Go back-N ARQ and Selective reject. Comment of the window size requirement in both the cases. [5]	2	4
Q.2(b) Define utilization efficiency of the link. Explain how the utilization efficiency is improved using Sliding window technique. [5]	2	3
Q.3(a) Implement a synchronous TDM scheme for the following signals: five 4kHz telephone channels, one 20kHz music channel and one 7.5kbps digital line. Find the data rate of the multiplexed signals; assume 4-bit PCM words. [5]	3	4
Q.3(b) Compare between circuit switching, message switching and packet switching [5]	3	2
Q.4(a) A packet switched Network with respective costs for each link marked aside is shown in Figure 1. [5]	4	3

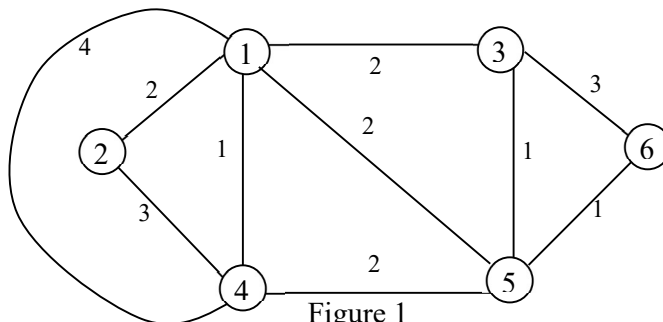


Figure 1

Find the least cost paths for all nodes by Dijkstra's algorithm, considering Node 4 as the source node.

Q.4(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] 4 3

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

Q.5(a) Explain the function of each layer of OSI protocol. Compare it with TCP-IP. [5] 5 2

Q.5(b) Draw the frame format of IP V-4 and Explain the individual block. If the IP address is 190.225.16.42. this address belongs to which class. What is the default mask of this class. [5] 5 3

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