

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

CLASS: M.C.A.
BRANCH: M.C.A.

SEMESTER: II
SESSION: SP/2025

SUBJECT: CA413 DATA COMMUNICATION & COMPUTER NETWORKS

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)	Describe the functions of the layers of the TCP/IP protocol architecture at the end hosts.	[5] 1,2	2
Q.1(b)	Explain real-life examples of various types of digital and analog transmission systems.	[5] 2,4	2
Q.2(a)	A channel has Bandwidth = 2 kHz, SNR = 15 dB, Signal levels (M) = 16. Find Nyquist maximum bit rate and Shannon channel capacity.	[5] 2,3	3
Q.2(b)	Describe the transmission characteristics of guided and unguided mediums	[5] 3,5	4
Q.3(a)	Briefly explain modulation techniques for analog signaling and compare their efficiency.	[5] 2,3	4
Q.3(b)	Present the main purpose of using a sliding window protocol in data communication? List the action sequence in the Go-Back-N error control mechanism when the ACK of any frame is lost.	[5] 3,4	5
Q.4(a)	Explain the basic difference between packet switching and circuit switching approaches. Describe how the virtual circuit switching technique shares the network resources between multiple communications, while using fixed path for each communication.	[5] 2,4	3
Q.4(b)	Illustrate the multiplexing technique used in the modern packet switched networks. Evaluate the suitability of this technique with respect to transmission overhead and quality.	[5] 4,5	4
Q.5(a)	Define internetworks. Differentiate between intra-network routing and inter-network routing. Give one example of each.	[5] 1,2,3,4	2
Q.5(b)	A <i>least cost algorithm</i> calculates the minimum cost path between nodes in a network. Give examples of cost-metrics for a network. Also, write & illustrate the steps of the Distance-vector routing method.	[5] 1,2,3,4	2

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