

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

CLASS: B. Tech.  
BRANCH: ECE

SEMESTER : VI/ADD  
SESSION : SP/2025

**SUBJECT: IT365 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)	Compare and contrast the OSI and TCP/IP reference models. Why is TCP/IP more widely implemented in modern networks despite the conceptual clarity of the OSI model?	[5] 1	2
Q.1(b)	Discuss the different types of noise that affect data communication and what are the common techniques used to reduce noise levels?	[5] 1	2
Q.2(a)	With the help of diagrams, explain the working of the following line coding schemes: a) NRZI (Non-Return to Zero Inverted) b) Differential Manchester Encoding	[5] 1	2
Q.2(b)	What is Pulse Code Modulation (PCM)? Explain the complete process of PCM.	[5] 2	2
Q.3(a)	What is unguided transmission media? List the various types and describe each.	[5] 2	1
Q.3(b)	A sender wants to transmit a message using CRC. The data to be sent is 1101011011, and the generator polynomial is 10011. Calculate the CRC bits and give the final transmitted message.	[5] 3	3
Q.4(a)	Explain in detail how Time Division Multiplexing (TDM) works. Differentiate between Synchronous TDM and Asynchronous (or Statistical) TDM.	[5] 4	2
Q.4(b)	Compare datagram and virtual circuit packet switching.	[5] 4	2
Q.5(a)	Explain Dijkstra's Algorithm in detail. How is it used to compute the shortest path from a source node to all other nodes in a network? Provide step-by-step calculations with an example network.	[5] 5	3
Q.5(b)	Write short notes on Asynchronous Transfer Mode (ATM) .	[5] 5	1

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