



Roll No:

BTECH

(SEM. VI) THEORY EXAMINATION 2025-26

DATA COMMUNICATION NETWORKS

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief. 02 x 7 = 14

Q. no.	Question	CO	Level
a.	Illustrate the differences between the OSI and TCP/IP models.	1	K2
b.	What is the purpose of protocols in data communication?	1	K1
c.	What is the HDLC protocol?	2	K1
d.	A sender transmits 1500 bits with 3% error probability. Calculate the number of erroneous bits.	2	K3
e.	Explain CSMA/CD.	3	K2
f.	Outline the differences between IPv4 and IPv6.	4	K2
g.	Define TCP protocol.	5	K1

SECTION B

2. Attempt any three of the following: 07 x 3 = 21

Q. no.	Question	CO	Level
a.	Discuss the OSI reference model and explain the functions of each layer.	1	K6
b.	Explain guided and unguided transmission media with suitable examples.	2	K5
c.	Discuss Wireless LAN IEEE 802.11 and Bluetooth communication standards.	3	K5
d.	Discuss different routing algorithms used in computer networks.	4	K6
e.	Discuss ATM technology and its role in high-speed communication networks.	5	K6

SECTION C

3. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Explain Internet architecture, protocols and standards used in networking systems.	1	K5
b.	Discuss different addressing techniques used in computer networks.	1	K6

4. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Discuss error detection and correction techniques with suitable examples.	2	K6
b.	A communication channel transmits 10^6 bits and receives 997000 bits correctly. Determine: (i) Number of erroneous bits (ii) Error percentage (iii) Transmission efficiency Also, discuss the importance of error control protocols	2	K5



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5. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Compare wired LAN and wireless LAN technologies based on speed, reliability and security.	3	K5
b.	A Fast Ethernet network operates at 100Mbps. Determine the time required to transmit a 1500-byte frame. Also, explain factors affecting Ethernet performance.	3	K5

6. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Explain the VLAN concept and the working of connecting devices in internetworking.	4	K5
b.	A router receives packets at a rate of 1200 packets/s and processes 950 packets/s. Determine: (i) Congestion rate (ii) Number of packets accumulated in 1 minute (iii) Also discuss techniques to reduce network congestion.	4	K5

7. Attempt any one part of the following: 07 x 1 = 07

Q. no.	Question	CO	Level
a.	Explain session layer design issues and services provided by transport layer protocols.	5	K5
b.	Explain TCP and UDP protocols with suitable diagrams and a comparison.	5	K6