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Printed Page:-4 **Subject Code:- BCSBS0602**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech
SEM: VI- THEORY EXAMINATION (2025 - 2026)
Subject: Computer Networks

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

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SECTION-A 20

1. Attempt all parts:-

(1.1) A computer network consists of___ (CO1, K1) 1

(a) A single device
(b) Interconnected computers
(c) Software only
(d) Database system

(1.2) A distributed system represents___ (CO1, K1) 1

(a) Independent machines
(b) Multiple systems working together
(c) One processor
(d) Standalone unit

(1.3) Multiplexing technique enables transmission of multiple signals over a single communication channel to improve___ (CO2, K2) 1

(a) Noise
(b) Efficiency
(c) Delay
(d) Error

(1.4) Wireless LAN allows devices to connect dynamically, improving_____ (CO2, K2) 1

(a) Flexibility
(b) Noise
(c) Delay
(d) Error

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(1.5) Error detection technique is used for identifying errors during data___ (CO3, K2) 1

(a) Transmission
(b) Storage
(c) Processing
(d) Encoding

(1.6) Hamming distance between 10101 and 11100 equals____. (CO3, K2) 1

(a) 2
(b) 3
(c) 4
(d) 5

(1.7) Network layer in OSI model is responsible for logical addressing and_____(CO4, K2) 1

(a) Routing
(b) Encoding
(c) Framing
(d) Modulation

(1.8) IPv4 address consists of total bits equal to_____(CO4, K1) 1

(a) 16
(b) 32
(c) 64
(d) 128

(1.9) _____ one of the following allows client to update their DNS entry as their IP address change. (CO5, K2) 1

(a) dynamic DNS
(b) mail transfer agent
(c) authoritative name server
(d) none of the mentioned

(1.10) A DNS client is called _____ (CO5, K1) 1

(a) DNS updater
(b) DNS resolver
(c) DNS handler
(d) none of the mentioned

2. Attempt all parts:-

(2.1) Describe switching techniques in networks. (CO1, K2) 2

(2.2) Describe channel allocation techniques used in multiplexing systems. (CO2, K2) 2

(2.3) State the concept of error detection in communication systems. (CO3, K2) 2

(2.4) State the concept of network layer in computer networks. (CO4, K1) 2

(2.5) Describe the working process of an e-mail system with protocols involved. (CO5, K2) 2

SECTION-B 30

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Answer any one of the following:-

(3.1) Describe the OSI model with its key points. (CO1, K2) 6

(3.2) What are the types of transmission media used in computer networks? (CO1, K2) 6

Answer any one of the following:-

(3.3) Describe the Virtual LAN along with its working process and key features in communication systems. (CO2, K3) 6

(3.4) Describe time division multiplexing and discuss its types along with synchronization requirements. (CO2, K3) 6

Answer any one of the following:-

(3.5) Describe the CSMA/CD and CSMA/CA techniques used in communication systems. (CO3, K4) 6

(3.6) Illustrate block coding and analyze its role in ensuring reliable transmission. (CO3, K4) 6

Answer any one of the following:-

(3.7) Determine network ID, broadcast address, and valid host range for IP 192.168.10.45/28. (CO4, K3) 6

(3.8) Calculate number of subnets and hosts per subnet for network 192.168.1.0/27. (CO4, K3) 6

Answer any one of the following:-

(3.9) Illustrate the different types of cryptography and describe its significance in networking. (CO5, K3) 6

(3.10) Describe SNMP protocol and discuss its importance in network management. (CO5, K2) 6

SECTION-C 50

4. Answer any one of the following:-

(4.1) Describe computer networks and distributed systems with their characteristics and differences. (CO1, K2) 10

(4.2) Discuss various classifications of computer networks based on size, topology, and transmission technology. (CO1, K2) 10

5. Answer any one of the following:-

(5.1) Describe the concept of frequency division multiplexing in detail along with its working principle, advantages, limitations, and practical applications in communication systems. (CO2, K3) 10

(5.2) Explain the applications of spread spectrum in modern wireless communication systems. (CO2, K2) 10

6. Answer any one of the following:-

(6.1) Explain the working of the CRC method at both the transmitter and receiver ends, using a suitable example. Additionally, discuss its applications in modern communication systems. (CO3, K3) 10

(6.2) Explain the significance of Sliding window protocol. Also, illustrate the working of selective repeat ARQ. (CO3. K3) 10

7. Answer any one of the following:-

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(7.1)	Explain the packet switching in detail. Differentiate between datagram and virtual circuit approaches. (CO4, K2)	10
(7.2)	Evaluate the differences between IPv4 and IPv6 with respect to address space, efficiency, and performance. Also, discuss the transition mechanisms from IPv4 to IPv6. (CO4, K4)	10

8. Answer any <u>one</u> of the following:-

(8.1)	Compare hardware firewalls and software firewalls. Explain how the firewalls are useful in protecting network resources. (CO5, K4)	10
(8.2)	Write the detailed notes on SNMP and FTP also including their working and applications. (CO5, K3)	10

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