

December 2023

**B.Tech.(IT)REAPPEAR - V SEMESTER**  
**Computer Networks (PCC-IT-501)**

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
  2. Answer any four questions from Part -B in detail.
  3. Different sub-parts of a question are to be attempted adjacent to each other.

**PART -A**

- Q1 (a) Name a network device that connects networks with different protocols. (1.5)
- (b) Explain the advantages of a mesh topology over bus topology? (1.5)
- (c) List the difference between a port address and a logical address (1.5)
- (d) Five channels each with 300 KHz bandwidth, are to be multiplexed together. (1.5)  
 What is the minimum bandwidth of the link if there is a need for a guard band of 20 KHz between the channels to prevent the interference?
- (e) How does a VLAN provide extra security for a network? (1.5)
- (f) Differentiate between piconet and scatternet. (1.5)
- (g) Define piggybacking. (1.5)
- (h) Differentiate between symmetric-key and asymmetric-key cryptography. (1.5)
- (i) Differentiate between a circuit-switched network and a packet-switched network. (1.5)
- (j) An address space has a total of 1024 addresses. How many bits are needed to represent an address? (1.5)

**PART -B**

- Q2 (a) Briefly explain the layered architecture of TCP/IP model. (10)
- (b) Explain how Frequency Hopping Spread Spectrum achieves bandwidth spreading (5)
- Q3 (a) Describe Dynamic Host Configuration Protocol and explain how it differs from BOOTP. (10)
- (b) Differentiate between IPv4 and IPv6 protocol. (5)
- Q4 (a) Illustrate the working of CSMA/CD using suitable flowchart (10)
- (b) Given the dataword 1010011110 and the divisor 10111. Show the generation of the codeword at the sender site using CRC method (using binary division). (5)
- Q5 (a) Discuss sliding window Protocol in data link control? (10)
- (b) In a block of addresses, we know the IP address of one host is 189.134.182.16/27. What are the first address (network address), the last address and valid range of addresses in this block? (5)

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- Q6 (a) Discuss the concept of traffic shaping. Illustrate the techniques to shape traffic. (10)  
(b) Explain Transmission Control Protocol in detail. (5)

Q7 Write Short Note on:

- a. Domain Name Space
- b. TELNET
- c. Firewalls

(15)

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PART - A

- (1.2) (a) Name a network device that connects networks with different protocols.
- (1.2) (b) Explain the advantages of a mesh topology over bus topology?
- (1.2) (c) List the difference between a port address and a logical address.
- (1.2) (d) Five channels each with 300 KHz bandwidth are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 20 KHz between the channels to prevent the interferences?
- (1.2) (e) How does a VLAN provide extra security for a network?
- (1.2) (f) Differentiate between piconet and scatternet.
- (1.2) (g) Define piggybacking.
- (1.2) (h) Differentiate between symmetric-key and asymmetric-key cryptography.
- (1.2) (i) Differentiate between a circuit-switched network and a packet-switched network.
- (1.2) (j) An address space has a total of 1024 addresses. How many bits are needed to represent an address?

PART - B

- (1.0) Q2 (a) Briefly explain the layered architecture of TCP/IP model.  
(2) (b) Explain how Frequency Hopping Spread Spectrum achieves bandwidth spreading.
- (1.0) Q3 (a) Describe Dynamic Host Configuration Protocol and explain how it differs from BOOTP.  
(2) (b) Differentiate between IPv4 and IPv6 protocol.
- (1.0) Q4 (a) Illustrate the working of CSMA/CD using suitable flowchart.  
(2) (b) Given the dataword 1010011110 and the divisor 1011. Show the generation of the codeword at the sender site using CRC method (using binary division).
- (1.0) Q5 (a) Discuss sliding window Protocol in data link control.  
(2) (b) In a block of addresses, we know the IP address of one host is 189.194.182.16. What are the first address (network address), the last address and valid range of addresses in this block?