

# CBCS SCHEME



21EC53

## Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Computer Communication Networks

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Describe the layers of the TCP/IP protocol suite and explain the service provided by each layer with the help of a neat diagram. (10 Marks)
- b. With neat diagrams, explain the working of ARP. Describe the structure and functions of various fields in the ARP packet. (10 Marks)

OR

- 2 a. With neat diagrams, explain the salient features, advantages and disadvantages of various physical topologies used in computer networks. (12 Marks)
- b. Explain with neat diagrams, the concepts of encapsulation and decapsulation at various layers of the TCP/IP protocol suite, during communication between two hosts. (08 Marks)

### Module-2

- 3 a. With clear examples, illustrate the following concepts and explain:  
(i) Byte stuffing and unstuffing  
(ii) Bit stuffing and unstuffing (10 Marks)
- b. An ALOHA network transmits 200 bit frames on a shared channel of 200 kbps. Calculate the throughput of the system if it produces 1000 frames per second in case of:  
(i) Pure ALOHA (ii) SLOTTED ALOHA (06 Marks)
- c. Explain the Ethernet Frame Format with a neat diagram. (04 Marks)

OR

- 4 a. With relevant flow diagrams, explain 1-persistent, non-persistent and p-persistent methods in CSMA. (10 Marks)
- b. Explain the working of CSMA/CA protocol with a neat flow diagram. Describe how CSMA/CA overcomes the problems of collision during handshaking and hidden stations. (10 Marks)

### Module-3

- 5 a. Explain virtual circuit approach used in packet switching. With neat diagrams and an example, illustrate the 3 stages of virtual circuit approach. (10 Marks)
- b. With a neat diagram, explain the IPv4 datagram. (10 Marks)

OR

- 6 a. Explain distance vector routing algorithm, using Bellman-Ford equations. Illustrate the same with an example. (10 Marks)
- b. Describe how the IPV4 address space is occupied in classful addressing. (04 Marks)
- c. An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its 3 subnets: one subblock of 10, one subblock of 60, and one subblock of 120 addresses. Design the subblocks. (06 Marks)



**Module-4**

- 7 a. Describe the connectionless and connection-oriented services provide by the transport layer in TCP/IP. (10 Marks)
- b. With a neat diagram, explain the TCP segment format, including the pseudoheader. (10 Marks)

**OR**

- 8 a. Explain the selective repeat protocol with neat diagrams and illustrate with an example. (10 Marks)
- b. The content of a UDP header format is given as CB84000D001C001C. Determine the following:
- (i) The source port number
  - (ii) The destination port number
  - (iii) Total length of the user datagram
  - (iv) Length of the data
  - (v) Is the packet directed from client to server or vice-verse? (05 Marks)
- c. Explain Checksum calculation in UDP using pseudoheader. (05 Marks)

**Module-5**

- 9 a. Explain the architecture of Electronic Mail, with a neat diagram. (10 Marks)
- b. Explain persistent and non-persistent connections in HTTP, with example. (10 Marks)

**OR**

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- 10 a. With a neat taxonomy, describe various security attacks in communication networks. (08 Marks)
- b. With neat diagrams, explain the following with respect to DNS:
- (i) Name space
  - (ii) DNS in the internet
  - (iii) Name Address Resolution (12 Marks)

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