



CBCS SCHEME

21EC53

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

Time: 3 hrs.

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

- 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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