

CBCS SCHEME

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21EC53

Fifth Semester B.E. Degree Examination, June/July 2024 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. Mention the layers of TCP/IP protocol suite and explain briefly about layers and protocols in each layer. (08 Marks)
- b. Explain the packet format of ARP and show the ARP request and ARP response transmissions with suitable example. (08 Marks)
- c. Discuss about link layer addressing. (04 Marks)

OR

- 2 a. Compare various physical topologies in a computer network. (08 Marks)
- b. Explain different services offered by data link layer in brief. Also explain three types of addresses used in link layer protocols. (08 Marks)
- c. Show the encapsulation and decapsulation representation in the TCP/IP model and explain. (04 Marks)

Module-2

- 3 a. Explain CSMA/CA protocol with a flow diagram. What are the three strategies used in CSMA/CA algorithm. (08 Marks)
- b. Explain the Ethernet frame format of standard Ethernet. What are the minimum and maximum length of the frame. (08 Marks)
- c. A network using CSMA/CD has a bandwidth of 10Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal) is $25.6\mu s$, what is the minimum size of the frame? (04 Marks)

OR

- 4 a. Explain spanning tree algorithm to solve looping problem in a system of connected LANs. (08 Marks)
- b. Explain VLAN. How is it used in grouping the stations? Explain the characteristics used to group the stations in VLAN. (08 Marks)
- c. In a standard Ethernet with the transmission rate of 10Mbps, assume that the length of the medium is 2500m and the size of the frame is 512 bits. The propagation speed of a signal in a cable is normally 2×10^8 m/s. Find the propagation delay, transmission delay, number of frames that can fit in the medium, and efficiency of standard Ethernet. (04 Marks)

Module-3

- 5 a. Explain IPv4 datagram format with neat diagram. (08 Marks)
- b. Explain distance vector routing algorithm using Bellman ford equation with suitable example. (08 Marks)
- c. An organization is granted a block of addresses with the beginning address 14.24.74.4/24. The organization needs to have 3 subblocks to use in its three subnets : one subblock of 10 addresses, one subblock of 60 addresses and one subblock of and one subblock of 120 addresses. Design the subblocks. (04 Marks)

OR

- 6 a. With a neat diagram, explain the IPv6 packet format. (08 Marks)
 b. Explain a simple implementation of Networks Address Translation (NAT) and address translation with a neat diagram. (08 Marks)
 c. Illustrate Path Vector Routing With An Example. (04 Marks)

Module-4

- 7 a. Describe the general services provided by UDP. Explain the different field in user datagram packet format with a neat diagram. (08 Marks)
 b. Explain the working of Go-back-N protocol. Also explain the send window ; sliding send window and receive window. (08 Marks)
 c. Following is the content of UDP header :
 CB84000D001C001C. Find the
 i) Source port number
 ii) Destination port number
 iii) Length of datagram
 iv) Length of data. (04 Marks)

OR

- 8 a. List the features of Transmission Control Protocol (TCP). Explain the TCP segment format with diagram. s (08 Marks)
 b. Explain the selective repeat protocol for flow control. Outline the send window and receive window structure for selective repeat protocol. (08 Marks)
 c. Suppose a TCP connection is transferring a file of 5000 bytes. The first byte is numbered 10001. What are the sequence numbers for each segment if data are sent in five segments, each carrying 1000 bytes? (04 Marks)

Module-5

- 9 a. Explain the following with respect to Hypertext Transfer Protocol :
 Persistent and non-persistent connection
 Message formats. (08 Marks)
 b. Explain the architecture of E-mail and protocols used in E-mail. (08 Marks)
 c. Write short notes on security attacks in the computer networks. (04 Marks)

OR

- 10 a. Explain the basic idea of File Transfer Protocol (FTP) and also explain the two connections in FTP. (08 Marks)
 b. Explain with a neat diagram, how leaky bucket algorithm can be implemented to control the traffic. (08 Marks)
 c. Write short notes on the purpose of Domain Name System (DNS). (04 Marks)

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