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15EC64

Sixth Semester B.E. Degree Examination, Feb./Mar. 2022
Computer Communication Networks

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1 a. List out the various components used in data communication networks and explain. **(04 Marks)**

   b. With the help of diagrams, explain the layers of TCP/IP and discuss the communication through internet. **(08 Marks)**

   c. Explain bit stuffing and byte stuffing with an example for each. **(04 Marks)**

OR

2 a. Explain with neat diagram the physical topologies for a computer network. **(04 Marks)**

   b. Explain the packet format of ARP and show the ARP request and ARP response transmissions with suitable example. **(08 Marks)**

   c. Explain the FSM for stop-and-wait protocol. **(04 Marks)**

Module-2

3 a. With the help of necessary diagrams, explain the operation of pure-ALOHA protocol. **(07 Marks)**

   b. Explain the different types of controlled access protocols in detail. **(06 Marks)**

   c. Define the type of the following addresses used in standard Ethernet:
   i)   4A:30:10:21:10:1A
   ii) 47:20:1B:2E:08:EE
   iii) FF:FF:FF:FF:FF:FF **(03 Marks)**

OR

4 a. A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system produces.
   i)   1000 frames per second
   ii) 500 frames per second
   iii) 250 frames per second. **(06 Marks)**

   b. With neat diagram, explain Ethernet frame format. **(05 Marks)**

   c. With the help of diagram, explain Gigabit Ethernet encoding scheme. **(05 Marks)**

Module-3

5 a. With necessary diagrams, explain the 3-categories of connecting devices used in internet. **(06 Marks)**

   b. Explain Virtual-LAN technology. **(06 Marks)**

   c. A block of classless address is given as 167.199.170.82/27. Find:
   i)   First address in the block
   ii) Last address in the block
   iii) Total number of addresses in the block. **(04 Marks)**

OR

6 a. Explain in detail, the layers used in Bluetooth. **(10 Marks)**
   b. 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 three subnets. One subblock of 10 addresses, one subblock of 60 addresses and one subblock of 120 addresses. Design the subblocks. **(06 Marks)**

Module-4

7 a. Explain IPV_4 datagram format in detail. **(08 Marks)**
   b. Explain the principle of distance-vector routing. **(08 Marks)**

OR

8 a. With neat diagrams, explain the general format of ICMP message. **(08 Marks)**
   b. Explain the 3-phases of operation used by a mobile host to communicate with a remote host. **(08 Marks)**

Module-5

9 a. Explain TCP segment format in detail. **(08 Marks)**
   b. Outline send window and receive window structure for selective-repeat protocol. **(08 Marks)**

OR

10 a. Explain TCP connection establishment and connection termination using 3-way handshaking. **(08 Marks)**
    b. Draw and explain FSM for Go-back-N protocol. **(08 Marks)**

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