18EC71

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
Computer Networks

Time: 3 hrs.   Max. Marks: 100

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

Module-1

1 a. Explain the functions of each layer in TCP/IP protocol suite. **(10 Marks)**
   b. Explain the components of a data communication. **(05 Marks)**
   c. Illustrate the concept of multiplexing and demultiplexing at the upper three layers of TCP/IP protocol suite. **(05 Marks)**

OR

2 a. Explain four physical topologies of a network. **(10 Marks)**
   b. With a neat diagram illustrate the concepts of encapsulation and decapsulation in internet. **(10 Marks)**

Module-2

3 a. Describe the operation of stop and wait protocol with FSM and flow diagram. **(12 Marks)**
   b. Define ARP and its position in TCP/IP protocol suite and also explain ARP operation with relevant diagram. **(08 Marks)**

OR

4 a. Explain how collisions are avoided through the use of CSMA/CA's three strategies with flow diagram. **(10 Marks)**
   b. Explain briefly 10 Base 5 and 10 Base T implementation. **(06 Marks)**
   c. A slotted ALOHA network transmits 200 bit frames using a shared channel with a 200 kbps bandwidth. Find the throughput if the system (all the stations together) produces.
      (i)   1000 frames per second
      (ii) 500 frames per second
      (iii) 250 frames per second **(04 Marks)**

Module-3

5 a. Compare and contrast connectionless packet-switched network with a virtual-circuit packet switched network using necessary diagrams. **(08 Marks)**
   b. An organization is granted a block of addresses with beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets, one sub-block of 10 addresses, one subblock of 60 addresses and one subblock of 120 addresses. Design the subblocks. **(06 Marks)**
   c. Explain MPLS packet, briefly. **(06 Marks)**

OR

6 a. Illustrate IPv4 datagram format. **(10 Marks)**
   b. Explain path-vector routing by using spanning tree. Also apply path-vector algorithm for updating path-vectors. **(10 Marks)**

Module-4

7   a.   Explain FSMs for Go-Back-N protocol with a neat diagram.   (08 Marks)
    b.   Explain the concept of sliding window in circular and linear formats with suitable figures.
                                                                                                (07 Marks)
    c.   Explain why the size of the Sender and Receiver windows chosen as one half of 2^m for Selective Repeat Protocol.   (05 Marks)

OR

8   a.   Explain TCP segment format.   (08 Marks)
    b.   Illustrate connection establishment in TCP using Three-way handshaking using suitable example.   (07 Marks)
    c.   Explain briefly Taho TCP with FSM.   (05 Marks)

Module-5

9   a.   Explain non-persistent connection with suitable example.   (08 Marks)
    b.   Explain client-server paradigm with an example.   (06 Marks)
    c.   Describe the three Mail Transfer Phases.   (06 Marks)

OR

10 a.   Explain DNS resolution and its type Recursive Resolution.   (07 Marks)
    b.   Explain briefly local versus remote lagging in Telnet with a neat diagram.   (07 Marks)
    c.   Describe the components of SSH.   (06 Marks)

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