2054
B.E. (Information Technology)
Fourth Semester
PCIT-402: Computer Networks

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt *five* questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I.   Attempt the following:-

a) Describe the looping problem in Bridge and also mention the solution for this problem.

b) Differentiate between Router and Switch.

c) Mention and explain the data flow methods used in data communications.

d) Find the maximum bit rate for a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels.

e) Explain the functions of the data link layer.   (5x2)

UNIT - I

II. a) List the basic network topologies and state the major advantage and disadvantage of each type with suitable diagram. Further, discuss the total number of links required to establish each topology consisting of N devices.

b) Explain the working of various switching techniques in computer networks and also state the advantages and disadvantages of each.   (6,4)

III. a) Define the importance of multiplexing. A channel of maximum capacity 125 kbps is to be multiplexed with three channels 50kbps, 50kbps, and 25kbps. Show the structure of Multiple-slot multiplexing with a suitable diagram.

b) Compute the propagation time (in milliseconds) and the transmission time (in seconds) for a 4MByte message (an image) if the bandwidth of the network is 1 Mbps? Assume that the distance between the sender and the receiver is 36,000 km and that light travels at 2.4×10^8 m/s.   (6,4)

P.T.O.

IV. a) Using the given data stream 00110011. Draw the graph for the following schemes.

(i) NRZ-L (ii) NRZ-I (iii) Manchester scheme (iv) Differential Manchester (v) AMI

b) Explain the reason for moving from the Stop-and-Wait Protocol to the Go- Back-N Protocol. Compare and contrast the Go-Back-N Protocol with Selective-Repeat with a suitable example. (2x5)

UNIT - II

V. a) Discuss IPv6 with suitable diagram and explain the use of six extension headers in it.

b) Explain the working of Stream Control Transmission Protocol (SCTP) along with its frame format and with various parameter descriptions. (2x5)

VI. a) Create two Sub-networks for a class C address 200.1.2.0 with a subnet value of 24. For each Subnetwork find the following:

i)   Total number of IP addresses available.

ii)   Valid hosts that can be assigned IP addresses.

iii)   Network address.

iv)   Broadcast address.

b) Explain distance vector routing protocol with the help of an example. (6,4)

VII. Write short notes on the following:-

a) Network Security

b) DNS

c) Crash Recovery

d) Congestion Control

e) Routing Algorithm (10)