504103

Mar. 2022
M.Tech. (CSE) I SEMESTER
Data Communication and Networks (MCN-18-101)

Time : 90 Minutes]   [Max. Marks : 25

Instructions :

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any three questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) Derive the relation between bit rate and baud rate.

    (1)

    (b) How does a network topology affect your decision in setting up a network?   (1)

    (c) Distinguish between baseband transmission and broadband transmission.   (1)

    (d) A frame of data length 1024 bytes is transmitted over a link with a bit error rate of 10^{-5}. Determine the probability that the frame will be received erroneously.

    (1)

(e) Explain the Cyclic Redundancy Check (CRC) method of error detection. (1)

(f) Explain why QAM is able to transmit data at higher rate compared with FSK and ASK? (1)

(g) Define piggybacking and its usefulness. (1)

(h) What is a bridge? (1)

(i) What is a mask in IPv4 addressing? What is default mask? (1)

(j) What is VLAN? (1)

PART-B

2. (a) A channel has a bit rate of 4 kbps and a propagation delay of 20 msec. For what range of frame sizes does stop-and-wait give an efficiency of at least 50 percent. (2)

(b) What is ALOHA protocol? Describe and compare Pure ALOHA and Slotted ALOHA protocols. (3)

3. How classless addressing scheme is better than classful addressing schemes? An ISP is granted a block of addresses starting with 170.150.0.0/16. The ISP needs to distribute these addresses to three groups of customers as follows:

(i) First group has 128 customers; each needs 128 addresses.

(ii) Second group has 64 customers; each needs 128 addresses.

(iii) Third group has 32 customers; each needs 64 addresses. Design the sub blocks and find out how many addresses are still available after these allocations. (5)

4. (a) Describe Distance vector routing? What is count to infinity problem? Give remedies for this problem with examples. (3)

(b) For a 4 Mbps Token ring LAN with propagation speed of 200 meter/µ sec, determine :

(i) What should be the minimum length of the ring?

(ii) What is the additional length gained by adding one station at a time? (2)

5. (a) What is congestion? How does it affect the performance of the network? Explain congestion control by "Leakey Bucket" method. (5)

6. Write short notes on the following :

(i) VoIP.

(ii) DQDB. (2.5×2=5)