

B.Tech. VIII Semester(Old/Back) Examination April/May - 2016

Electronics & Comm. Engg.

8EC1 (O) Computer Networks

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit - I

1. a) Assuming that customers arrive in a Poisson fashion to the counter of supermarket at an average rate of 15 per hour and the service by the clerk has an exponential distribution.

Determine at what average rate must a clerk work in order ensure a probability of 0.90 that the customer will not wait longer than 12 minutes. (8)

- b) Explain mathematical model for M/M/m/m queues. (8)

OR

1. a) The capacity of communication line is 2000 bit/second. This line is used to transmit eight bit characters, so the maximum rate is 250 characters/second. The application calls for traffic from many devices to be sent on the line with a total volume of 12,000 characters/minute.

Determine

i) The line utilization (3)

ii) The average number of characters waiting to be transmitted. (3)

iii) The average transmission time (including queuing delay) per character. (2)

- b) Consider the M/M/1/K queuing system show that

$$L_o = L - (1 - P_0)$$

$$W_o = \frac{1}{\mu} L$$

$$W = \frac{1}{\mu}(L + 1)$$

Where

L_a = Average number of customers in queue

L = Average number of customers in system

W_a = Average amount of time that a customer spends waiting in the queue.

W = Amount of time that a customer spends in system. (2+3+3)

Unit - II

2. a) A message is broken up into three pieces. Discuss the transmission of the packet using the datagram approach to packet switching. (6)
- b) A three stage switching structure is to accommodate $N = 128$ input and 128 output terminals. For 16 first stage and 16 last stage determine the number of cross points for non blocking. (6)
- c) What is the difference between network layer delivery and transport layer delivery. (4)

OR

2. a) A channel has a bit rate of 4 kbps and propagation delay of 20 msec. For what range of frame size does stop and wait gives an efficiency of at least 50 percent. (8)
- b) Describe the Go Back N protocol. (8)

Unit - III

3. a) Show that slotted ALOHA has a maximum throughput of twice the maximum throughput of pure ALOHA. (8)
- b) Briefly describe various CSMA protocols. (8)

OR

3. a) In a pure ALOHA system the packet arrival time from a poisson distribution having a rate of 10^3 packets/sec. If the bit rate is 10 mbps and there are 10,000 bits/packet, find
 - i) Normalized throughput of the system
 - ii) Number of bits per packet that will maximize the throughput. (4+4)
- b) Draw the diagram for IEEE 802.5 token ring priority scheme. Explain briefly the steps for working. (8)

Unit - IV

4. a) Explain with example how distance vector routing is used to route the packet and why count to infinity problem arises and how does to get solved. (10)
- b) A company is granted a site address 201.70.64.0. The company needs six subnets. Design the subnets. (6)

OR

4. a) Compare IPV₄ and IPV₆. (5)
b) A class B network on internet has a subnet mask of 255.255.240.0. What will be the maximum number of hosts per subnet. (5)
c) Write short note on network layer design issues. (6)

Unit - V

5. a) List the merits and demerits of frame relay with respect to X. 25. (6)
b) With a suitable sketch explain ATM cell format for user network interface. (4)
c) Compare the three B - ISDN access methods. (6)

OR

5. a) Explain ATM adaption layer in detail. (8)
b) Write short notes on
i) DTE - DCE interface
ii) B - ISDN services. (4+4)