Total No. of Questions : 12]

SEAT No. :

**P850**

[Total No. of Pages : 3

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## B.E (Computer Engineering)

## b - DESIGN AND ANALYSIS OF COMPUTER NETWORKS

## (Elective - I) (2008 Course) (Semester - I)

*Time : 3 Hours]* *[Max. Marks : 100*

***Instructions to the candidates:***

1) ***Answer 3 questions from Section - I and 3 questions from Section - II.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

## SECTION - I

***Q1)*** a) Explain the characteristics of queuing system and the six parameters associated with Kendall Notations. **[8]**

b) Messages (independently) arrive to a system at the rate of 10 per minute. Their lengths are exponentially distributed with an average of 3600 characters. They are transmitted on a 9600 bps channel. A character is 8 bits long. **[10]**

i) What is the average service time?

ii) What is the arrival rate?

iii) What is the service rate?

iv) What is the utilization of the server?

OR

***Q2)*** a) Explain significance and applications of Little's theorem in queuing theory. **[8]**

b) Customers arrive at a watch repair shop according to a Poisson process at a rate of one per every 10 minutes, and the service time is an exponential r.v. with mean 8 minutes. **[10]**

***P.T.O.***

i) Find the average number of customers L, the average time a customer spends in the shop W, and the average time a customer spends in waiting for service Ws.

ii) Suppose that the arrival rate of the customers increases 10 percent. Find the corresponding changes in L,W, and Ws.

***Q3)*** a) Describe in brief various system design techniques available. Give the advantages of virtualization in system design. **[8]**

b) Compare merits and demerits of first, second and third generation switches. **[8]**

OR

***Q4)*** a) Explain the importance of performance metrics and systems constraints in network design. What are the common resources need to be considered while designing the networks. **[8]**

b) Explain the functioning of Banyan switch. **[8]**

***Q5)*** a) What is scheduling? Describe the best effort and guaranteed service connections scheduling. **[8]**

b) Comment on the advantages and disadvantages of TCP Tahoe and TCP Reno flow control scheme. **[8]**



OR

***Q6)*** a) Describe the functioning of Deficit Round Robin scheduling discipline with suitable example. **[8]**

b) Consider ATM virtual circuits A and B with arrival rates 10 and 25 Mbps that share an OC3 link. Suppose that with FCFS, both their mean queuing delays are 0.5ms, and that with a new discipline, A's mean delay is reduced to 0.1ms. What is B's new mean queuing delay? **[8]**

## SECTION - II

***Q7)*** a) Explain Guaranteed-service and Best effort service traffic classes with suitable application. **[8]**

b) Explain the Quality-of-Service (QoS) parameters used in ATM Forum and IETF approaches. **[8]**

OR

***Q8)*** a) What is admission control strategy? Explain any one admission control strategy. **[8]**

b) What is Signaling? Which are the types of signaling? Explain Signaling System No. 7 in telephone networks. **[8]**

***Q9)*** a) What is routing? Explain the functions and responsibilities of a router. **[8]**

b) Explain with block diagram Lookup operation in a classful IP addressing scheme. **[8]**

OR

***Q10)*** a) Explain the architecture of router along with the fields in the routing table. **[8]**

b) Explain the Random Early Detection packet scheduling algorithm. **[8]**

***Q11)*** a) An organization uses a class C network decided to subnet into four different subnets calculate the appropriate subnet mask for the same. How many hosts will be supported in each subnet? **[6]**

b) Explain any five network management related tools/commands used by the Network Administrator. **[6]**

c) Explain the significance of WAN bandwidth management in a typical enterprise network. **[6]**

OR

***Q12)*** Write short notes on- **[18]**

a) Variable length subnet masking.

b) Capacity Planning.

c) Security Management.

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