

Total No. of Questions : 12]

SEAT No. :

**P850**

**[4659] - 228**

[Total No. of Pages : 3

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

- 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.

