Total No. of Questions : 12]

P3130

SEAT No. :

[Total No. of Pages : 3

B.E. (Electronics & Telecommunication)
TELECOMMUNICATION SWITCHING SYSTEMS (404187)
(2008 Pattern) (Semester-II)

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

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Answer any three questions from each section.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Use of Calculator is allowed.*
6) *Assume Suitable data if necessary.*

SECTION-I

Q1) a) Draw neat diagram of Time division time switching and explain two basic ways to control time stage memories. **[8]**

b) Derive an expression for unavailability of Dual processor configuration. Calculate and compare the unavailability of single and dual processor for MTBF = 2200 Hrs and MTTR = 6 Hrs for a span of 25 yrs. **[8]**

OR

Q2) a) Explain the following with reference to Loss systems: **[8]**
   i) Lost Calls Cleared.
   ii) Lost Calls Return.

b) A group of seven trunks is offered 3E traffic. Find **[4]**
   i) Grade of service and
   ii) Probability that at least one trunk is free.

c) During one hour of busy period, 1500 calls arrive in an exchange. If average holding time per call is 5 minutes. Estimate traffic in erlangs and CCS units. **[4]**

Q3) a) Explain following terms with reference to Lost-call systems: **[8]**
   i) Pure-Chance traffic.
   ii) Statistical equilibrium.
   iii) Full availability.
   iv) Calls which encounter congestion are lost.

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b) Define the following terms: **[8]**
   i) Traffic Intensity.
   ii) Call Completion Rate.
   iii) Busy Hour.
   iv) Offered and Carried traffic.

OR

Q4) a) Derive and explain second Erlang distribution formula of Queuing systems. **[8]**

b) Explain the principle of Common channel signalling and list its two advantages. **[8]**

Q5) a) Explain principle of Grading. Draw neat diagram of sixteen trunks interconnected to two groups of switches of availability 10. Find its traffic capacity if the required grade of service is 0.01 and traffic carried is 4.5E. **[8]**

b) With neat diagram explain the working of fully connected three stage switching network and derive the expression to find minimum switching elements. **[10]**

OR

Q6) a) Explain the following terms: **[8]**
   i) Call packing.
   ii) Rearrangeable networks.

b) What are the basic call processes to be performed by switching systems in PSTN network. **[10]**

SECTION-II

Q7) a) Compare Voice traffic and Data traffic. With neat diagram explain the operation of Circuit switched network. **[8]**

b) Define the term clock wander and jitter with phase locked loop clock recovery circuit and explain its operation with waveforms. **[8]**

OR

Q8) a) List approaches used in synchronizing a digital network. Explain with neat diagram Master-slave synchronization. **[8]**

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b) What is the goal of Network management? Explain in brief the routing and flow control in network management. **[8]**

Q9) a) Draw and explain with neat diagram TDM-Switch Interface using an elastic store. **[8]**

b) Draw and explain functional groupings and ISDN reference points. **[8]**

OR

Q10) a) Classify data networks. With neat diagram explain data communication using PSTN and State two advantages and disadvantages of LANs. **[8]**

b) Explain the need of Pulse-Stuffing in asynchronous multiplexing. **[8]**

Q11) a) A cellular system carrying a geographical area of 1600 km^2 supports 1140 radio channels. If the frequency reuse concept is implemented in this system such that the first tier co-channel of any given cell is located by traversing three cells along a chain of hexagons and two cells after a clockwise turning by 60 degree. **[10]**
Determine for a cell area of 6 km^2.
  i) The number of cells in each cluster.
  ii) The number of cellular clusters in the system.
  iii) The area of each cellular cluster.
  iv) The increased system capacity.
  v) The number of radio Frequency channels serviced by each cell with and without frequency reuse.

b) Explain step by step call procedures in completing a call from Mobile (cellular) to wireline (PSTN). **[8]**

OR

Q12) a) Explain in brief two methods of increasing capacity in Cellular networks and

Determine: **[10]**
  i) The channel capacity for a cellular telephone area comprised of 19 macro cells with 15 channels per cell.
  ii) Channel capacity if each macro cell is split into 7 mini cells.
  iii) Channel capacity if each mini cell is further split into four micro cells.

b) List the differences between Personal Communication System and Standard Cellular system. Give advantages of Digital TDMA System.

[8]

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