M.E. (ETC) Examination, 2013
2nd Semester

TELECOMMUNICATION SWITCHING SYSTEMS
(ETC 1040)

Full Marks – 70. Time – 3 Hrs.

The questions are of equal value.

Two marks are reserved for neatness and presentation in each half

Answer any six questions taking any three questions from each half

Answer should be brief and to the point.

FIRST HALF

Answer any three questions

1(a) Describe the working principle of crossbar switching with the help of 3 x 3 crossbar switching.

(b) What is DTMF signaling? What are its advantages?

(c) Briefly describe a crossbar exchange organization. How does a call processing progress in a crossbar exchange? 3+3+5

2(a) Derive the minimum number of switching elements in a three stage network. Given that MTBF=4000 hours and MTTR=4 hours, calculate the unavailability for single and dual processor systems.

(b) Discuss Distributed SPC in the light of Level 1, Level 2 and Level 3 processing. 4+7

3(a) Briefly discuss about Conference call facility provided by SPC in the light of Three party conferencing connection.

(b) Differentiate between single stage and multistage networks. How a NxN network can be represented by a two-stage network? How can full connectivity be ensured by such a representation? 4+7

4(a) Give a schematic diagram of Delta modulation scheme? What is slope overload?

(b) What is quantization noise in PCM? Derive an expression for quantization noise as a function of step size. If a minimum signal-to-quantization noise ratio of 33 dB is desired, how many bits per code word is required in a linearly quantized PCM system?

(c) Illustrate HDB3 codes with suitable exhibits. 3+6+2

5(a) Calculate the maximum access time that can be permitted for the data and control memories in a TSI switch with a single input and single output trunk multiplexing 2500 channels. Also, estimate the cost of the switch and compare it with that of a single stage space division switch.

(b) Discuss serial in/serial out and parallel in/serial out configurations of time multiplexed time switch.

(c) Discuss three stage combination switching briefly. 3+5+3

SECOND HALF

Answer any three questions

1 What are the assumptions in the analysis of Birth-Death process? With necessary state diagrams, derive the steady state behavior of a telecommunication switching system modeled as a Birth- Death process. 3+8

2 What is the necessary condition for stable operation of the delay systems? Derive the Erlang C formula for determining the probability of a message being delayed. 3+8

3 What are Basic rate access and Primary rate access in ISDN system? With necessary diagrams, discuss the ISDN protocol architecture. What are backbone LANs? 3+5+3

4 What is Medium Access Control(MAC)? With necessary diagrams, explain the MAC frame format. Describe with necessary diagrams, the CSMA/CD system in context of Ethernet switching. 3+4+4

5 What are the different criteria that a transparent bridge should meet? What are the different issues that need to be considered for a bridge connecting different LAN? What is local internetworking? 4+3+4