Registration No. : | | | | | | | | | | |

Total number of printed pages – 2

B. Tech

PEEC 5417

Seventh Semester Back Examination – 2014

DIGITAL SWITCHING AND TELECOMMUNICATION NETWORKS

BRANCH (S) : EC, ETC

QUESTION CODE : L 163

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) In a 100 line folded network, how many switching elements are required for non blocking operation.

   (b) What do you mean by baseline network in a two stage network configuration ?

   (c) What are the differences between single stage and multistage network ?

   (d) Calculate the access time of the memory modules in parallel in serial out time switch using 64 input and 64 output streams with each stream multiplexing 32 channels.

   (e) What is the value of GOS in delay system ? Are GOS and Blocking probability the same ?

   (f) Write the Steady state equation of a B-D process for no calls in progress.

   (g) What is the difference between echo suppressor and echo canceller ?

   (h) In a packet switching network, a typical packet is represented as P_{6432}. What does the subscript associated with the packet indicate ?

   (i) What are types of fundamental channels in ISDN ?

   (j) Which layer in the ISO-OSI reference model takes care of coding ?

2. (a) What do you understand by SPC in telecom switching systems ? Why redundant processors are used in centralized SPC system ? What sort of configuration with dual processors system is best suited for handling traffic overloads ? Explain with simple block diagram the system operation. 5

(b) Indicate the levels of processing for carrying out control functions in a distributed SPC system. In which level microprogramming is a favored choice ? What is switching processor ? Why the O and M processing is usually done by a main frame ? 5

3. (a) Represent an N×N three stage network and find out the minimum number of switching element required for the network. 5

(b) Can a three stage network be nonblocking ? Show a three stage nonblocking network configuration and calculate the number of switch elements required with N=128. What is its switch-advantage ratio ? 5

4. (a) Find out the differential equation governing the dynamics of a telecom switching system modeled as Birth-Death process. Also find out the steady state equation. 5

(b) What are models of a Loss System ? In an exchange, the calls arrive at the rate of 1100 calls per hour, with each call holding for duration of three minutes. If the demand is serviced by a trunk group of 50 lines, determine the GOS. 5

5. (a) Find out the probability of blocking in two stage TS switch. 5

(b) In a TS switch M=128, N=16 and the number of subscribers connected to the system is 0.1 MN, determine the blocking probability of the switch if

(i) All the subscribers are active at the same time.

(ii) Only 50% of the subscribers are active simultaneously. 5

6. (a) Explain the circuit switched data transfer operation. Find out the expression for total propagation time in a circuit switched connection. 5

(b) A circuit switched connection involves 5 switching nodes. Each node takes 2 seconds and 0.2 seconds for establishing and releasing connections respectively. If the data transfer rate is 2400 bps. Compute the data transfer time for a message that is 300 byte long. What do you conclude about the efficiency of a circuit switching for this problem ? 5

7. (a) Find out maximum throughput achieved in pure ALOHA scheme. Explain how the throughput can be increased by slotted ALOHA scheme. 5

(b) What are the Basic topologies and Routing methods that are adopted for interconnecting telecom exchanges for different traffic intensities ? 5

8. Write short notes on any **two** of the following : 5×2

(a) Signaling Techniques

(b) Enhanced Services

(c) Broad Band ISDN

(d) End-to-End Layers.