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**Second Semester M.Tech. Degree Examination, Dec.2014/Jan.2015**  
**Switching and Statistical Multiplexing in**  
**Telecommunication**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FIVE full questions.**  
**2. Missing data, if any, may be suitably assumed.**

1. a. Explain the working of a simplex telephone circuit. Write and explain the equation for instantaneous resistance and instantaneous current in the microphone. (06 Marks)
- b. With a neat diagram, explain the elements of a switching system. When a connection is established, list the different forms of signaling used in switching subsystems. (10 Marks)
- c. Differentiate between a folded network and a non – folded network. (04 Marks)
2. a. List and explain the features of digital signal processing in telecommunication systems. Discuss in detail any two applications of digital signal processing. (10 Marks)
- b. With an example, explain the procedure for establishing a connection in a crossbar switch. (10 Marks)
3. a. List six events that may occur in a telephone system and the corresponding actions that may have to be taken by the common control system. (10 Marks)
- b. With a neat diagram, explain the level – 3 processing in distributed SPC. Also indicate the characteristics of electronic control schemes. (10 Marks)
4. a. Define SDL. List the advantages of SDL. (08 Marks)
- b. In a switching system running thousands of processes, it cannot easily be determined that a process is in infinite loop. What safeguards can be built into the operating sys to prevent processes running indefinitely? (06 Marks)
- c. Explain the different types of difficulties in call forwarding across exchanges. (06 Marks)
5. a. A sine wave with 1V maximum amplitude is to be digitized with minimum SOR of 30 dB. How many uniformly spaced quantization levels are needed? Also indicate the number of bits needed to encode the sample. (04 Marks)
- b. Explain the need for vocoder over normal A – D coding techniques. List and explain atleast two different types of vocoding, mentioning the two – phase description – analysis and synthesis. (10 Marks)
- c. Write and explain the compression and inverse compression functions for A-law companding. (06 Marks)
6. a. Describe the output controlled time division space switch. Bring out the general memory controlled version of this switch. (10 Marks)
- b. Explain the parallel-in/serial-out configuration of a time multiplexed time switch to handle NM subscribers. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Consider a group of 1200 subscribers which generate 600 calls during the busy hour. The average holding time is 2.2 minutes. What is the offered traffic in erlangs, CCS and CM? (04 Marks)
- b. During a busy hour, 1400 calls were offered to a group of trunks and 14 calls were lost. The average call duration has 3 minutes. Find : (06 Marks)
- Traffic offered
  - Traffic carried
  - GOS and
  - The total duration of period of congestion.
- c. Explain the steady state behaviour of telecommunication switching system when system is modeled as B – D process. Clearly state the assumptions and analysis. (10 Marks)
- 8 Write short notes on : (20 Marks)
- Diagonal cross-point matrix
  - $N \times N$  three – stage switching network
  - Line coding
  - Cost comparison of STS and TST switches.