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**Second Semester M.Tech. Degree Examination, June / July 2013**  
**Switching and Statistical Multiplexing in**  
**Telecommunications**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1
  - a. What is side tone? Explain the working of a telephone circuit with side tone coupling. (08 Marks)
  - b. Explain with the help of block diagram, the elements of a switching system. (08 Marks)
  - c. In what way the stored program control (SPC) is superior to hard wired control? (04 Marks)
- 2
  - a. What are the advantages of digital voice networks? (10 Marks)
  - b. Explain the common control function in switching system. (10 Marks)
- 3
  - a. Explain the touch tone dial telephone. List the design considerations against talk off. Discuss any two in brief. (10 Marks)
  - b. Write the diagram of  $3 \times 3$  cross bar and explain the principle of cross bar switching. (10 Marks)
- 4
  - a. Explain in brief, how the dual processor architecture of present day electronic switching system can be configured to operate in three different modes. (12 Marks)
  - b. Discuss the differences between single stage and multistage networks. (08 Marks)
- 5
  - a. Explain the PCM system for speech communication. (08 Marks)
  - b. What is Vocoder? Explain the types of vocoders. (06 Marks)
  - c. Explain the following codes with example :  
 i) Walsh code 1 ii) AMI code iii) Unipolar NRZ code. (06 Marks)
- 6
  - a. Explain the Serial – in / Serial – out and Parallel – in / Serial – out configurations of time multiplexed time switch. (10 Marks)
  - b. Calculate number of trunks that can be supported on a time multiplexed space switch given that : i) 32 channels are multiplexed in each stream ii) control memory access time is  $100\eta s$  iii) Bus switching & transfer time is  $100\eta s$  per transfer. (04 Marks)
  - c. Calculate the maximum access time that can be permitted for data and control memories in a TSI switch with a single input and single output trunk multiplexing 2500 channels. Also estimate the cost of switch and compare it with that of a single stage division switch. (06 Marks)
- 7
  - a. Define the following, with respect to Traffic engineering : (06 Marks)  
 i) Busy Hour ii) Peak Busy Hour iii) Busy hour call attempts  
 iv) Time consistent busy Hour v) Traffic intensity vi) Blocking probability.
  - b. A group of 20 servers carry a traffic of 10 erlangs. If the average duration of a call is 3 minutes, calculate the number of calls put through by a single server and the group as a whole in a one – hour period. (04 Marks)
  - c. With necessary equations explain : i) Markov process ii) Birth death processes. (10 Marks)
- 8 Write short notes on :
  - a. DC wander line
  - b. Companding
  - c. Grade of service
  - d. DSP applications. (20 Marks)