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**Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Digital Switching Systems**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. Explain the network services with diagram showing the relationship of service and bearer networks. (07 Marks)
- b. Explain the principle of operation of four-wire circuit with neat diagram. (08 Marks)
- c. Explain the principles of time-division multiplexing transmission with elementary TDM system and channel pulse trains. (05 Marks)
- 2 a. What are the different functions of switching system? Explain briefly. (05 Marks)
- b. Explain the cross bar system with matrix of cross points. (05 Marks)
- c. With diagram, explain the basic central office linkages, (relevant to MDF, TDF, power plant give explanation). (05 Marks)
- d. Explain the switching system hierarchy with relevant diagram. (05 Marks)
- 3 a. Explain the congestion in telecommunications traffic system. (05 Marks)
- b. During the busy hour, 1200 calls were offered to a group of trunks and six calls were lost. The average call duration was 3 minutes. Find:
  - i) The traffic offered.
  - ii) The traffic carried.
  - iii) The traffic lost.
  - iv) The grade of service.
  - v) The total duration of the periods of congestion. (05 Marks)
- c. Explain the lost call system with assumptions, diagram and mathematical expressions. (10 Marks)
- 4 a. Explain the principles of gradings diagrams showing sixteen trunks interconnected to two groups of switches of availability 10. Write the following: i) Full diagram; ii) Grading diagram. (08 Marks)
- b. Design a three-stage network for connection 100 incoming trunks to 100 outgoing trunks. Assume suitable data. (06 Marks)
- c. Explain briefly about grades of service of link systems. (06 Marks)

**PART – B**

- 5 a. With relevant diagram explain the principle of operation of the space switch showing the 'K' incoming PCM highways and the in outgoing PCM highways. (08 Marks)
- b. Explain the structure of time-space-time (T-S-T) switching network with m is number of PCM highways and 'n' is number of time slots. (07 Marks)
- c. With diagram, explain the following exchange synchronization systems:
  - i) Single ended unilateral system.
  - ii) Double-ended unilateral system. (05 Marks)

- 6 a. With relevant diagram, explain the digital switching system software classification briefly. (08 Marks)
- b. With neat diagram, explain the operation of the software linkages during a call. (08 Marks)
- c. Name the different categories of call features. (04 Marks)
- 7 a. With flowchart explain the operation of interfaces of a typical digital switching system central office. (07 Marks)
- b. With relevant block diagram approach explain the strategy for improving software quality. (08 Marks)
- c. Write a note on 'Defect Analysis'. (05 Marks)
- 8 a. Explain briefly about generic switch hardware architecture with relevant diagram. (08 Marks)
- b. Explain about some of the common characteristics of digital switching systems. (07 Marks)
- c. Write note on 'Analysis Report'. (05 Marks)

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