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**Eighth Semester B.E. Degree Examination, June/July 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. Write four-wire circuit used in two-way transmission network and explain its working principle. (08 Marks)
- b. Explain network topologies in brief. (06 Marks)
- c. Express the following power levels in dBm and dBW: (06 Marks)
  - (i) 1 mW;
  - (ii) 1 W;
  - (iii) 2 mW
- 2 a. Design a 10,000 line step-by-step telephone exchange with a suitable diagram. (06 Marks)
- b. Enumerate the functions of switching system. (08 Marks)
- c. Explain the operation of BORSCHT circuit with a suitable block diagram. (06 Marks)
- 3 a. Derive an expression for second Erlang's distribution formula. (08 Marks)
- b. A group of 20 trunks provides a grade of service of 0.01 when offered 12 E of traffic:
  - (i) How much is the grade of service improved if one extra trunk is added to the group?
  - (ii) How much does the grade of service deteriorate if one trunk is out of service? (06 Marks)
- c. A group of five trunks is offered 2E of traffic:
 

Find

  - (i) The grade of service.
  - (ii) The probability that only one trunk is busy.
  - (iii) The probability that only one trunk is free.
  - (iv) The probability that at least one trunk is free. (06 Marks)
- 4 a. Deduce the expression to determine the total number of cross points for two stage network with incoming trunks M greater than outgoing trunks N. (06 Marks)
- b. Explain progressive, skipped and homogeneous gradings. (06 Marks)
- c. Design a three stage network for 100 incoming trunks and 400 outgoing trunks. (08 Marks)

**PART – B**

- 5 a. Explain space-time-space switching network with a suitable block diagram. (07 Marks)
- b. Describe the frame alignment and synchronization networks. (07 Marks)
- c. Explain cross-bar or space switching with a suitable diagram. (06 Marks)
- 6 a. Explain the classification of digital switching system with a suitable block diagram. (10 Marks)
- b. Describe the concept of software linkages during a call required in telephony system. (10 Marks)
- 7 a. Describe the organizational interfaces of a typical digital switching system control office. (10 Marks)
- b. Use strategic analysis and highlight to improve the software quality with a neat block diagram. (10 Marks)
- 8 a. Write a call connection flow-chart and a basic steps necessary to complete a simple call through a digital switching system. (12 Marks)
- b. Write short notes on:
  - (i) Common characteristics of digital switching system.
  - (ii) Analysis report for digital switching system. (08 Marks)

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