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10EC82

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:
(i) 1 mW; (ii) 1 W; (iii) 2 mW **(06 Marks)**

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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