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**Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020**  
**Digital Switching Systems**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1
  - a. With a neat diagram, explain the national telecommunications network. (08 Marks)
  - b. With a neat diagram, explain the principle of operation of a four wire circuit. (08 Marks)
  - c. What is bit interleaving and word interleaving? Explain with examples where are they used. (04 Marks)
- 2
  - a. Bring out the differences between message switching and circuit switching. (06 Marks)
  - b. Explain the operation of distribution frames with a neat diagram. What are the significance of distribution frames? (10 Marks)
  - c. Describe the different facilities provided by electronic switching. (04 Marks)
- 3
  - a. Derive Erlang's lost call formula and explain the meaning of pure chance traffic and statistical equilibrium. (10 Marks)
  - b. A group of 20 trunks provide a GOS of 0.01 when offered 12E of traffic. How much is the GOS improved if one extra trunk is added to the group? (06 Marks)
  - c. A group of 20 trunks carry a traffic of 10E. 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 one hour period. (04 Marks)
- 4
  - a. Briefly explain the following terms as applied to gradings:
    - i) Graded groups
    - ii) Availability
    - iii) Progressive grading
    - iv) Skipped grading
    - v) Homogeneous grading. (10 Marks)
  - b. A 3 stage fully interconnected switching network is to connect 600 incoming trunks to 100 outgoing trunks. It is to use switches assembled from blocks of size  $5 \times 5$ . Design a suitable network and determine the number of switch blocks required. (10 Marks)

**PART – B**

- 5
  - a. With the help of neat diagrams, explain space switch and time switch. (12 Marks)
  - b. A T-S-T network has 20 incoming and 20 outgoing PCM highways. Each connecting 30 channels. The required GOS is 0.01. Find the traffic capacity of the network if
    - i) Connection is required to a particular free channel on a selected outgoing highway.
    - ii) Connection is required to a particular outgoing highway but any free channel on it may be used. (08 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.

- 6 a. Briefly explain the software architecture for the three levels of control of a Digital Switching System. (10 Marks)
- b. Explain the call forwarding feature with a neat flow diagram. (10 Marks)
- 7 a. Explain the methodology for reporting and correcting the field problems with a neat diagram. (06 Marks)
- b. Explain the various causes of digital switch outages. (06 Marks)
- c. Explain the strategy used for improving software quality. (08 Marks)
- 8 a. With neat diagrams, explain line to trunk intra IC OGT call and trunk to line inter IC OGT call. (12 Marks)
- b. Explain some common characteristics of Digital Switching Systems. (08 Marks)

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