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10EC82

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 5×5 . 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)

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- 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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