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10EC82

**Eighth Semester B.E. Degree Examination, Feb./Mar. 2022**  
**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 hierarchy used in the national Public Switched Telephone Network (PSTN). (08 Marks)
- b. Explain the 3D-channel PCM primary multiplex, with a neat diagram. (08 Marks)
- c. A four wire circuit has an overall loss (Two-wire to two-wire) of 1db and the balance return loss at each end is 6db. Find: i) The singing point ii) The stability margin  
iii) The attenuation of talker and listener echo. (04 Marks)
- 2 a. Differentiate between circuit switching and message switching. (06 Marks)
- b. With a neat block diagram, explain subscriber's line interface circuit for a digital switch. (06 Marks)
- c. Explain the basic functions of a switching systems. (08 Marks)
- 3 a. Define the following terms: i) Traffic intensity ii) Grade of service iii) Busy hour  
iv) Holding time. (04 Marks)
- b. Derive an expression for the second Erlang's distribution starting from basic principles. (12 Marks)
- c. On an average, one call arrives every 5 seconds. During a period of 10 seconds. What is the probability that  
i) No call arrives  
ii) One call arrives  
iii) Two call arrives  
iv) More than two calls arrive. (04 Marks)
- 4 a. What is Grading? Explain types of grading. (08 Marks)
- b. Explain two stage switching network with necessary equations. (08 Marks)
- c. Design a three-stage network for 100 incoming trunks and 400 outgoing trunks. (04 Marks)

**PART - B**

- 5 a. Explain the principle operation of T-S-T network and S-T-S network. With neat diagram. (12 Marks)
- b. Explain frame alignment of PCM signals in digital exchange. (08 Marks)
- 6 a. Explain the basic software architecture of a typical digital switching system. (10 Marks)
- b. Wire a short notes on a basic call model. (10 Marks)
- 7 a. Write a short notes on the interfaces of a typical digital switching system central office. (10 Marks)
- b. Explain the methodology used for reporting and correcting of field problems. (10 Marks)
- 8 a. Write a short note on digital switching system hardware architecture. (10 Marks)
- b. Explain the three level scheme of recovery strategy in a digital switch. (10 Marks)

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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.