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10EC82

**Eighth Semester B.E. Degree Examination, Jan./Feb. 2023**  
**Digital Switching Systems**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Explain the principle operation of a four wire circuit with neat diagram. (08 Marks)
- b. Express the following power levels in dBm and dBW:  
(i) 1 mW      (ii) 1 W      (iii) 2mW      (iv) 100 mW (04 Marks)
- c. Explain the PCM primary multiplex with neat diagram (30 channel or 24 channel format any one). (08 Marks)
- 2 a. Explain in brief different functions of a switching system. (06 Marks)
- b. Explain distribution frames in stronger exchange with neat diagram. (08 Marks)
- c. Explain basic central office linkages with suitable diagram. (06 Marks)
- 3 a. Define and explain the following terms:  
(i) Traffic intensity      (ii) Grade of service  
(iii) Busy hour      (iv) Occupancy (06 Marks)
- b. From the basic principles of queuing systems, derive the equation for finite queue capacity. (10 Marks)
- c. On an average, during the busy hour a company makes 180 outgoing calls of average duration of 3 minutes, it receives 400 incoming calls of average duration 6 minutes. Find:  
(i) The outgoing traffics  
(ii) The incoming traffic  
(iii) The total traffic (04 Marks)
- 4 a. What is grading? Explain any two types of gradings. (06 Marks)
- b. Derive an expression for grade of service of a 3 stage network. (08 Marks)
- c. Derive a 3 stage network for connecting 100 incoming trunks to 100 outgoing trunks. (06 Marks)

**PART – B**

- 5 a. Draw and explain the operation of time switch implementation. (08 Marks)
- b. Discuss the need for frame alignment in time division switching networks. (06 Marks)
- c. Explain single ended unilateral and bilateral synchronization system. (06 Marks)
- 6 a. Explain in brief Basic Software Architecture used in Digital Switching Systems. (14 Marks)
- b. Explain in brief call models and connect sequence. (06 Marks)
- 7 a. Describe the various organizational interfaces of a typical DSS central office. (10 Marks)
- b. Explain with a neat diagram a strategy for improving software. (10 Marks)
- 8 a. Explain in brief generic switch hardware architecture. (08 Marks)
- b. Explain in brief common characteristics of a Digital Switching System. (08 Marks)
- c. Write a short note on Recovery Strategy. (04 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.