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Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
Digital Switching Systems

Time: 3 hrs.

Max. Marks:100

Note : 1. Answer any FIVE full questions, choosing at least two questions from each part.
2. Missing data may be suitably assumed.

PART - A

1. a. Explain in brief with a neat diagram different Network configurations and structures. (08 Marks)
b. Explain in brief Regulations, standards in a telecommunication network. (06 Marks)
c. Explain in brief Power Levels encountered in Telecommunication – Transmission systems. (06 Marks)
2. a. Explain in brief the operation of a Four – Wire circuit used in Two-way Transmission systems. (08 Marks)
b. A Four Wire Circuit has a Round-trip delay of 20ms. The Propagation time for the 2 wire circuit connected is 1ms at each end, and it's attenuation is 6 dB. The balance return loss is 3 dB, stability margin is also 3 dB. Determine:
i) Attenuation of the Talker Echo. ii) Attenuation of the Listner Echo. (06 Marks)
iii) Delays of the Talker and Listner Echoes. (06 Marks)
c. Explain in brief PCM primary Multiplex group. (06 Marks)
3. a. Explain in brief what do you mean by message switching and circuit switching. (06 Marks)
b. Explain in brief different functions of a switching system. (06 Marks)
c. Explain in brief with a neat diagram distributed systems. (08 Marks)
4. a. Define and explain the following terms:
ii) Traffic Intensity; ii) Grade of service; iii) Busy hour; (05 Marks)
iv) Blocking Probability; v) Blocking Network.
b. Derive the Erlangs second distribution equation in case of switching systems, for a finite queue capacity. (10 Marks)
c. During the busy hour, on average 30E is offered to a group of trunks. On average, total period during which all trunks are busy is 12 secs and two calls are lost. Find the average no. of calls carried by the group and average call duration. (05 Marks)

PART - B

5. a. With a neat sketch, explain a space switch for K incoming PCM highways and m outgoing PCM highways. (08 Marks)
b. Discuss the need for frame Alignment in time division switching networks. Explain double ended unilateral and bilateral synchronization systems. (12 Marks)
6. a. Explain in brief Basic software Architecture used in digital switching systems. (14 Marks)
b. Explain in brief calls models and connect sequence. (06 Marks)
7. a. Explain in brief system outage and it's impact on DSS Reliability. (06 Marks)
b. Explain in brief a methodology for proper maintenance of a DSS, such as diagnostic capabilities and firmware deployment. (08 Marks)
c. Explain in brief a strategy for improving software quality. (06 Marks)
8. a. Explain in brief generic switch hardware architecture. (06 Marks)
b. Explain in brief common characteristics of a Digital switching system. (08 Marks)
c. Write short notes on:
i) Reliability Analysis or Network Control Processors. ii) Recovery Strategy. (06 Marks)

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Fifth Semester B.E. Degree Examination, Dec.09/Jan.10
Digital Switching Systems

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.
2. Assume missing data suitably.

PART – A

- 1 a. Briefly explain the different network structures used in communication. (08 Marks)
- b. Explain the principle of operation of four wire circuits, with the help of a neat diagram. (08 Marks)
- c. Give the need for standards. (04 Marks)
- 2 a. Define: i) Traffic ; ii) Congestion ; iii) Lost call systems. (06 Marks)
- b. During the busy hour, on average, a customer with a single telephone line makes three calls, and receives three calls. The average call duration is two minutes. What is the probability that a caller will find the line engaged? (04 Marks)
- c. Derive an expression for second Erlang distribution from the basic principles. (10 Marks)
- 3 a. List the functions of switching systems. (08 Marks)
- b. With a neat diagram, explain basic call processing of incoming and outgoing calls through digital switching systems. (09 Marks)
- c. Define the different facilities provided by electronic switching. (03 Marks)
- 4 a. What is grading? Explain any two types of gradings. (06 Marks)
- b. Derive an expression for grade of service of a three stage network. (08 Marks)
- c. Derive a three stage network for connecting 100 incoming trunks to 100 outgoing trunks. (06 Marks)

PART – B

- 5 a. Explain space switch with the help of a neat diagram. (08 Marks)
- b. An STS network has 16 incoming and 16 outgoing highways, each of which conveys 24 PCM channels. Between the incoming and outgoing space switches, there are 20 links containing time switches. During busy hour, the network is offered 300 Erlangs of traffic. Estimate grade of service 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)
- c. Explain the need for frame alignment in time division switching network. (04 Marks)
- 6 a. List the call features. (05 Marks)
- b. Briefly explain the basic call model. (06 Marks)
- c. Explain the three modes of operation for call forwarding using simple flow diagrams. (09 Marks)
- 7 a. Explain the organizational interfaces of a typical DSS central office. (10 Marks)
- b. What is system outage impact on digital switching system? (04 Marks)
- c. Write a brief note on defect analysis. (06 Marks)
- 8 a. Explain generic switch hardware architecture with a neat diagram. (09 Marks)
- b. Explain the three level scheme of recovery strategy in a digital switch. (06 Marks)
- c. List the basic steps necessary to complete a simple call. (05 Marks)

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Important Note : 1. On completing your answers, d. isorily draw diagonal cross lines on the remaining bla. ges.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, not be treated as malpractice.

