06EC55

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

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.

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) (06 Marks)

b. Explain in brief different functions of a switching system.c. Explain in brief with a neat diagram distributed systems.

(08 Marks)

a. Define and explain the following terms:

ii) Traffic Intensity; ii) Grade of service; iii) Busy hour;

iv) Blocking Probability; v) Blocking Network.

(05 Marks)

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)

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.

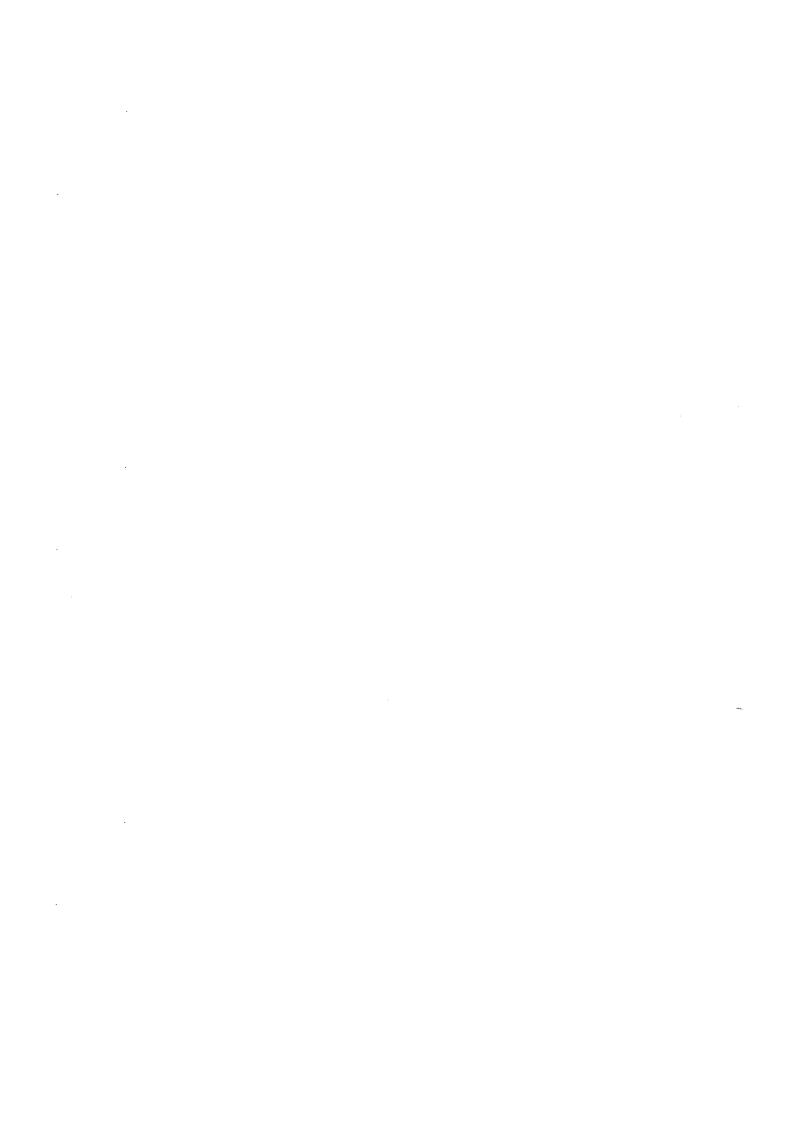
(06 Marks)

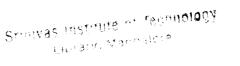
b. Explain in brief common characteristics of a Digital switching system.

(08 Marks)

c. Write short notes on:

i) Reliability Analysis or Network Control Processors. ii)Recovery Strategy. (06 Marks)







(10 Marks)

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Fifth Semester B.E. Degree Examination, June-July 2009 **Digital Switching Systems**

Time: 3 hrs. Max. Marks:100

> Note: 1. Answer any FIVE full questions, choosing at least two questions from each part.

at least two questions from each part. 2. Missing data may be suitably assumed.					
Part A					
1	a. b. c.	Explain various types of network structures. Explain frequency division multiplexing with respect to a suitable block diagram. Design any one type of PDH with a suitable diagram.	(05 Marks) (08 Marks) (07 Marks)		
2	a. b. c.	Highlight the advantages and disadvantages of crossbar switch. Describe the functions of switching system. Explain the working of distribution frame in strowger exchange.	(06 Marks) (06 Marks) (08 Marks)		
3	a. b. c.	What is grading? Describe various types of gradings. Design a two-stage network to connect 12 incoming trunks to 9 outgoing trunks at the optimum solution. Deduce the total number of cross points to three stage switching network with N and M outgoing trunks.	(08 Marks)		
4	a. b.	Derive second Erlang's distribution formula. On an average, during the busy hour, a company makes 180 outgoing calls duration of 3 minutes. It receives 400 incoming calls of average duration 6 minute i) The outgoing traffic. ii) The incoming traffic.	(08 Marks) calls of average ninutes. Find:		
	c.	 iii) The total traffic. A group of 20 trunks provides a grade of service of 0.01 when offered 12 E of traffic. i) How much is the GOS improved if one extra trunk is added to the group? ii) How much does the GOS deteriorate if one trunk is out of service? 	(06 Marks) fic, (06 Marks)		
		Part B			
5	a. b. c.	 Explain time-space-time switch with a suitable diagram. Explain frame synchronization. A T-S-T network has 20 incoming and 20 outgoing PCM highways, each conchannels. The required grade of service is 0.01. Find the traffic capacity of the net 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 the channel	work if: iighway i.e.		
6	a. b.	Explain the working of operating system indicating the basic software architecture of ypical digital switching system. (12 Marks With a suitable diagram, explain software linkages during a call. (08 Marks)			
7	a. b.	Explain the interfaces of digital switching central office. Highlight the strategy for improving software quality.	(10 Marks) (10 Marks)		
8	a.	Explain generic switch software with respect to a suitable block diagram.	(10 Marks)		

b. Explain recovery stage of initialization process with examples.



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

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> Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.

		2. Assume missing data suitably.	,•			
	PART – A					
1	a. b.	Explain the principle of operation of four wire circuits, with the help of a neat diagram	8 Marks) m. 8 Marks)			
	c.		4 Marks)			
2	a. b.	During the busy hour, on average, a customer with a single telephone line makes thr and receives three calls. The average call duration is two minutes. What is the protection that a caller will find the line engaged?				
3	a. b. c.	With a neat diagram, explain basic call processing of incoming and outgoing calls digital switching systems. (0	8 Marks) through 9 Marks) 3 Marks)			
4	a. b. c.	Derive an expression for grade of service of a three stage network. (0 Derive a three stage network for connecting 100 incoming trunks to 100 outgoing trunks to	6 Marks) 8 Marks) inks. 6 Marks)			
		PART – B				
5	a. b.					

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	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:

- Connection is required to a particular free channel on a selected outgoing highway. i)
- Connection is required to a particular outgoing highway, but any free channel on it ii) may be used. (08 Marks)
- Explain the need for frame alignment in time division switching network. (04 Marks)
- List the call features. (05 Marks)
 - Briefly explain the basic call model. (06 Marks)
 - Explain the three modes of operation for call forwarding using simple flow diagrams.

(09 Marks)

- Explain the organizational interfaces of a typical DSS central office. 7 (10 Marks) What is system outage impact on digital switching system? b. (04 Marks)
 - c. Write a brief note on defect analysis. (06 Marks)
- Explain generic switch hardware architecture with a neat diagram. 8 (09 Marks)
- Explain the three level scheme of recovery strategy in a digital switch.
 - (06 Marks)

List the basic steps necessary to complete a simple call. (05 Marks)