(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2896 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VIII) EVEN THEORY EXAMINATION 2012-13

ELECTRONICS SWITCHING

Time : 3 Hours *Total Marks : 100*

Note :– (1) Attempt **ALL** questions.

(2) **All** questions carry equal marks.

(3) In case of numerical problems assume data wherever not provided.

1. Attempt any **four** parts of the following : **(5×4=20)**

(a) Discuss the evolution of digital switching system. Explain the block diagram of subscriber's line interface circuit for a digital exchange.

(b) Enlist the various switching techniques in PSTN. Explain how packet switching is better than circuit switching for data communication system.

(c) Write short notes on crossbar switching configuration and crosspoint technology.

(d) Differentiate between Single stage and multistage networks.

(e) Discuss the blocking probabilities using Lee Graphs and define an expression for the blocking probability of three stage switch in terms of inlet utilization P.

(f) Design a strictly three stage nonblocking network for 100 incoming and 100 outgoing trunks using minimum number of crosspoints.

2. Attempt any **four** parts of the following : **(5×4=20)**

(a) Can you build a switch with a single TSI which can handle 120000 calls with a DRAM access time of around 80 ns ? Explain.

(b) Discuss a Digital Memory Switch in Time Division Switching.

(c) Explain the concept of multiframing for PCM signaling in 30 channels with 2Mbit/s PCM system has 32 b-bit time slots.

(d) Determine the implementation complexity of the TS Switch in Time space switching matrix, where the number of TDM input line N = 80. Assume each input line contains a single DS 1 signal (24 channels).

(e) Four 30 channel TDM streams are multiplexed to form one input stream of an 8-stream TS switch. Determine the cost of the configuration including that of the multiplexers.

(f) Discuss the limitation of time division space switching and time slot interchange switch. Write short notes on TSSS switch.

3. Attempt any **four** parts of the following : **(5×4=20)**

(a) Discuss the Birth-Death process. Find out the equation which governs the dynamic of renewal process.

(b) During the busy hour, 1200 calls were offered to a group of trunks and six calls were lost ; the average call duration was 3 minutes. Find :

(i) The traffic offered

(ii) The traffic carried

(iii) The traffic lost

(iv) The grade of service

(v) The total duration of the periods of congestion.

(c) A rural telephone exchange normally experiences four call originations per minute. What is the probability that exactly 8 calls occur in an arbitrarily chosen interval of 30 seconds ?

(d) Compare loss system and delay system with appropriate example.

(e) A call processor in an exchange required 120 ms to service a complete call. What is BHCA rating of the processor ? If the exchange is capable of carrying 700 erlange of traffic, what is the call completion rate ? Assume an average call holding time of 2 minutes.

(f) In an exchange, the calls arrive at the rate of 1100 calls per hour, with each call holding for duration of 3 minutes. If the demand is serviced by a trunk group of 50 lines, calculate the grade of service (GOS).

4. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain the concept of centralized SPC and Distributed SPC with levels of processing. Discuss the level of control function in an exchange. What are various types of software used for SPC working ?

(b) Explain the various techniques of providing redundancy in SPC exchange. Given that MTBF (mean time between failure) = 2000 hours and MTTR (mean time to repair) = 4 hours, calculate the unavailability for single and dual processor system.

(c) Explain Common Channel Signaling with SS7 architecture. Explain the important features and frame structure of HDLC.

5. Attempt any **four** parts of the following : **(5×4=20)**

(a) Draw TCP/IP reference model. Explain how IP addressing is achieved.

(b) Explain the call establishment/release process in ATM using Virtual channel and Virtual paths.

(c) Using block diagram discuss the Public X-2.5 Packet switching network for LAN interconnects to implement a corporate wide area network.

(d) Write short note on ATM Memory Switch.

(e) Determine the memory required for an ATM switch fabric using shared-memory architecture in support of 12 STS (OC-3) bidirectional ports.

(f) Draw and explain a 16 × 16 Banyan switching fabric.