

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

PAPER ID : 2896 Roll No. 

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**B.Tech.**

(SEM. VIII) THEORY EXAMINATION 2011-12

**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) Discuss why digital telephonic is suitable for electronics exchange. Using block diagram define "BORSCHT".

(c) With the help of suitable diagram explain the working of Strowger Switching System and define the following parameters :

(i) Switching capacity (SC)

(ii) Traffic handling capability (TC)

(iii) Equipment utilization factor (EUF)

(iv) Cost capacity index (CCI).

(d) With the help of suitable diagram describe the working of a Crossbar exchange.

(b) (i) What are various types of software used for SPC working ?

(ii) Discuss the concept of reliability and availability conditions of processors in Telecom 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) Enlist the various signaling techniques used in telecom networks. Explain Common Channel Signaling with SS7 architecture.

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 basic techniques used in packet switching for routing control.

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

(d) Write short note on Banyan network switch.

(e) Using block diagram discuss the Frame relay service for LAN interconnects to implement a corporate wide area network.

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

- (e) Give the classification of switching system. Compare the switching techniques used in PSTN.
- (f) A three stage fully interconnected switching network is to connect 600 incoming trunks to 100 outgoing trunks. It is to use switches assembled from blocks of size  $5 \times 5$ . Design a suitable networks and determine the number of switch blocks required.
2. Attempt any **four** parts of the following :— (5×4=20)
- (a) Draw the functional blocks of a memory based time division switch and discuss the concept of time division time switching scheme.
- (b) Explain the STS switching.
- (c) Calculate the number of trunks can be supported on a time multiplexed space switch, given that :
- 32 channels are multiplexed in each system
  - control memory access time is 200 ns
  - Bus switching and transfer time is 200 ns per transfer.
- (d) How many time slot interchange modules are needed for an STS switch with 128 primary TDM signal 30 voice channel per input ? Assume blocking to be less than 0.002 and the loading is 0.2 Erlang per channel and determine the complexity of the switch.
- (e) Can you build a switch with a single TSI which can handle 120000 calls with a DRAM access time of around 80 ns ? Explain.
- (f) Discuss a Digital Memory Switch in Time Division Switching.

3. Attempt any **four** parts of the following :— (5×4=20)
- (a) A subscriber makes 3 calls of duration of 8, 2, 4 minutes during 2 hours of a day. Calculate the BHCA and Erlang capacity of exchange if all its 5000 subscribers have same traffic per hour and CCR of 80%.
- (b) Explain the modeling of a telephone traffic system as birth-death process.
- (c) Explain the Delay line system in telecom traffic.
- (d) In an exchange, the calls arrive at the rate of 1100 calls per hour, with each call holding for duration of 3 minute. If the demand is serviced by a trunk group of 50 lines, calculate the grade of service (GOS).
- (e) An exchange is designed to handle 2000 calls during the busy hour. One day, the number of calls during the busy hour is 2200. What is the grade of service (GOS) ?
- (f) What is Eugest traffic ? Show that GOS for such traffic is given by :

$$GOS = \left[ \frac{N - R}{N - A_o} \right] P_R \text{ where}$$

N — Number of subscriber,

R — number of servers,

$A_o$  — carried traffic,

$P_R$  — Blocking probability.

4. Attempt any **two** parts of the following :— (10×2=20)
- (a) Explain the concept of centralized by SPC and distributed SPC with levels of processing. Differentiate between the characteristic of electronic control schemes (Microprogrammed control and hardwired control).