

01

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

PAPER ID : 2896

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**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.

- (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 :
- (i) 32 channels are multiplexed in each system
  - (ii) control memory access time is 200 ns
  - (iii) 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 Eugene traffic ? Show that GOS for such traffic is given by :

$$\text{GOS} = \left[ \frac{N - R}{N - A_0} \right] P_R \text{ where}$$

N — Number of subscriber,

R — number of servers,

A<sub>0</sub> — carried traffic,

P<sub>R</sub> — 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).

- (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.