

B.TECH.
SEVENTH SEMESTER EXAMINATION, 2003-2004
✓ TELECOMMUNICATION SWITCHING

Time : 3 Hours

Total Marks : 100

Note : Attempt **ALL** questions.

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

- (a) Differentiate between folded and non-folded networks. Draw a block schematic diagram to show the various elements of a switching system.
- (b) What are the basic approaches to the design of subscriber access to Strowger system. Explain briefly.
- (c) Distinguish between earth testing and battery testing as applied to hunting operations in Strowger exchanges. Discuss relative merits of each method.
- (d) Draw the block diagram of a typical 10,000 line Strowger exchange.
- (e) What are the differences between common control and direct control ?
- (f) Estimate the number of cross points required to design an exchange that supports 500 users on a non-blocking basis and 50 transit outgoing or incoming calls simultaneously.

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

- (a) During a 2 hour busy period, 2400 calls arrive at an exchange. Average holding time

70

EC-701

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Turn Over

per call is two minutes. What is the traffic load in erlangs and in CCS ?

- (b) Define grade of service (GOS) for any exchange. What does a higher value of GOS signify ?
- (c) With Poisson arrival of two calls per minute, what is the probability that more than three calls will arrive in two minutes ? What is the time during which at least four calls will arrive with a probability of more than 95 per cent ?
- (d) Compare Lost Calls Held System (LCHS), against delay systems. A Time Assigned Speech Interpolation (TASI) System has 10 channels and 20 sources connected to it. What is the clipping probability if the activity factor for each source is 0.4 ?
- (e) List out important random variables in queuing systems. For a delay system having infinite queue capacity, what is the necessary condition for its stable operation ?
- (f) With the help of a state transition diagram, explain a Birth-Death process, in short, with reference to a telecommunication network.

3. Attempt any *TWO* of the following :— (10×2=20)

- (a) How does distributed stored program control differ from centralized stored program control ? Discuss the three levels of processing in distributed SPC briefly.
- (b) Compare single stage networks with multistage networks. Explain a two-stage network with multiple switching matrices in each stage and find the expression for calculating the blocking probability.

(c) Explain the basic operation of time multiplexed time switches by elaborating the principle of time slot interchange. In how many ways can a time multiplexed time switch be configured ?

4. Attempt any TWO of the following :— (10×2=20)

(a) How do the termination requirements in a digital telephony system differ from those required for an analog telephony system ? List and discuss at least five advantages of digital transmission of speech over analog transmission.

(b) Discuss the architecture of SS7, giving the basic operations performed by different levels.

(c) Giving the hierarchial structure adopted by CCITT, discuss the routing plan for international telephone calls.

5. Attempt any TWO of the following :— (10×2=20)

(a) Explain packet switching by giving a typical packet format and packet switching network schematic diagram. What are the services available through packet switching networks ?

(b) Which are the layers in OSI model known as end-to-end layers ? List out the operation performed by these layers in data networks.

(c) Write a short note on Integrated Services Digital Network (ISDN) giving motivation for it, services offered and architecture considerations.

