

Code: D-20
Time: 3 Hours
100

Subject: ELECTRONIC SWITCHING SYSTEMS
June 2006

Max. Marks:

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
 - **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
 - **Any required data not explicitly given, may be suitably assumed and stated.**
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Q.1 Choose the correct or best alternative in the following: (2x10)

a. Side tone is the speech heard by

- (A) the receiving subscriber
- (B) both the receiving and calling subscriber
- (C) by on looker
- (D) by calling subscriber

b. Busy hour traffic is the

- (A) maximum average simultaneous traffic.
- (B) traffic during peak hour.
- (C) traffic when all subscribers are engaged.
- (D) the duration of maximum calls.

c. The final selector is connected to the

- (A) calling subscriber. (B) switching network.
- (C) called subscriber. (D) line finder.

d. In a DTMF phone a dialling of 8 generates

- (A) 1336 Hz- 770 Hz (B) 1209 Hz - 1477 Hz
- (C) 1209 Hz- 941 Hz (D) 1336 Hz-852 Hz

e. SPC stands

- (A) Standard Protocol Control (B) Stored Program Control
- (C) Signaling and switching Centre (D) Signaling Process Center

f. For two stage network the switching elements for M inlets with r blocks and N outlets with s blocks is given by

- b. Show how finite state machine model helps in designing a switching system and give a typical example. **(8)**

- Q.5** a. Through two block diagrams explain the difference between Space division and time division switching. **(8)**

- b. Define congestion and grade of service. In a particular exchange during busy hour 1200 calls were offered to a group of trunks, during this time 6 calls were lost. The average call duration being 3 minutes. Calculate:

- (i) traffic offered in erlangs'
- (ii) traffic lost
- (iii) grade of service and
- (iv) period of congestion **(8)**

- Q.6** a. Distinguish between single stage and multistage networks. **(10)**

- b. In a two stage network there are 512 inlets and outlets, $r=s=24$. If the probability that a given inlet is active is 0.8, calculate:

- (i) The switching elements
- (ii) Switching capacity
- (iii) Blocking probability **(6)**

- Q.7** a. Explain the CCITT hierarchical structure of switching and routing using block schematic. **(8)**

- b. In a subscriber loop that contains a series resistance of 300 ohms to protect the batteries in the exchange, a normalized telephone draws 10 mA and its standard input d.c. resistance is 50 ohms. Calculate the maximum distance at which a subscriber can get good speech reproduction if a cable of 52 ohms/km resistance is used. If a standard hand set of 30 mA current is used what will be the change. **(8)**

- Q.8** a. What are the advantages of CCS over in-channel signalling. **(8)**

- b. Show how the signalling has progressed from SSI to SS7. **(8)**

- Q.9** a. What is the need of MODEM in data communication. Explain at least one modulation technique used for high speed modems. **(10)**

- b. What are the advantages and disadvantages of packet switching over circuit switching. **(6)**

