

**Subject: TELECOMMUNICATION SWITCHING SYSTEMS**

Time: 3 Hours

**JUNE 2011**

Max. Marks: 100

**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.**
  - **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
  - **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 the best alternative in the following: (2×10)**

- a. On average, during busy hour, a company receives 200 incoming calls of average duration 3 minutes. The incoming traffic is \_\_\_\_\_
- (A) 4 Erlangs. (B) 10 Erlangs.  
(C) 14 Erlangs. (D) 6 Erlangs.
- b. In queuing system, the trunks are often called \_\_\_\_\_
- (A) Nodes (B) Stations  
(C) Servers (D) Systems
- c. For a triangular cross point matrix for connecting both way trunks, the number of cross points required is \_\_\_\_\_
- (A)  $N(N-1)/2$  (B)  $N(N+1)/2$   
(C)  $N(N-1)$  (D)  $(N-1)/2$
- d. The status signal which is sent back to inform the caller of the progress of the call is usually \_\_\_\_\_
- (A) Dial tone (B) Ring tone  
(C) Multi tone (D) Busy tone
- e. In SPC, both the processors configured in load sharing are \_\_\_\_\_
- (A) working independently (B) working dependently  
(C) receiving identical inputs (D) used in standby mode

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- f. A push button telephone uses \_\_\_\_\_
- (A) dual tone multi frequency signalling.
  - (B) single tone multi frequency signalling.
  - (C) dual tone single frequency signalling.
  - (D) single tone single frequency signalling.
- g. In Frequency Division Multiplexing system, the carriers are separated at intervals \_\_\_\_\_
- (A) 8 kHz.
  - (B) 10 kHz.
  - (C) 4 kHz.
  - (D) 20 kHz.
- h. CCS messages are usually only routed through one intermediate node is known as \_\_\_\_\_
- (A) Signal Transfer Point.
  - (B) Signal Channel Point.
  - (C) Message Transfer Point.
  - (D) Message Channel Point.
- i. If the two networks use the same protocol, they may be linked by a simple apparatus called \_\_\_\_\_.
- (A) Header.
  - (B) Sequencer.
  - (C) Bridge.
  - (D) Router.
- j. An ATM operates in \_\_\_\_\_
- (A) Virtual Call Mode.
  - (B) Private Call Mode.
  - (C) Datagram Mode.
  - (D) Packet Switching Mode.

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**Answer any FIVE Questions out of EIGHT Questions.**  
**Each question carries 16 marks.**

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- Q.2** a. Explain the two-motion selector arrangement with a neat sketch. (8)
- b. With the help of a block diagram, explain the basic elements of a switching system. (8)
- Q.3** a. Explain the second Erlang distribution. (8)
- b. A group of five trunks is offered 2E of traffic. Find:
- (i) The grade of service
  - (ii) the probability that only one trunk is busy
  - (iii) the probability that only one trunk is free
  - (iv) the probability that at least one trunk is free (8)
- Q.4** a. Explain the principle of grading for twenty trunks connected in two separate groups. (8)

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- b. Design a three-stage network for connecting 100 incoming trunks and 400 outgoing trunks. (8)
- Q.5** a. What is meant by time multiplexed space switching and explain time multiplexed space switch which has N-incoming and N-outgoing trunks, each carrying M samples per frame. (8)
- b. What are the advantages of combination switching and explain a two-stage combination switch with a neat diagram. (8)
- Q.6** a. Explain state transition diagram and draw the simplified state transition diagram for a local call. (8)
- b. Explain (i) Reliability, (ii) Availability and (iii) Security connected to telephone exchanges. (8)
- Q.7** a. Explain out-band signalling and in-band signalling in FDM carrier system. (8)
- b. Explain CCITT signalling system number 7 with a neat block diagram. (8)
- Q.8** a. Explain Broadband networks. (6)
- b. Write a short note on Ring Networks. (6)
- c. Explain Datagram and Virtual circuits. (4)
- Q.9** a. Draw and explain the architecture of intelligent network. (8)
- b. Briefly explain ISDN. (8)