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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.**

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.

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

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 [illegible] 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)**

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