# DipIETE – ET (NEW SCHEME)  –  Code: DE62

## Subject: TELECOMMUNICATION SWITCHING SYSTEMS

Time: 3 Hours                        Max. Marks: 100

JUNE 2010

**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 the best alternative in the following:**                    **(2×10)**

a. Telephone network follows _____ switching.

   **(A)** Message                        **(B)** Circuit
   **(C)** Packet                         **(D)** Channel

b. Automatic Telephony was invented by _____.

   **(A)** Marconi                        **(B)** Abraham Lincoln
   **(C)** A.B. Strowger                  **(D)** Charles Babbage.

c. Telephone Traffic intensity is measured by _____.

   **(A)** Coloumbs                       **(B)** Faraday
   **(C)** Erlang                         **(D)** Watts

d. Switching system with $n \times m$ sets of contacts with $n \times m$ activators is known as _____.

   **(A)** Crossbar                       **(B)** Step by Step
   **(C)** Electronic                     **(D)** Mechanical

e. Final selector stage of Step-by-Step system determines _____ digits of telephone number

   **(A)** Last one                       **(B)** Last two
   **(C)** Last three                     **(D)** None

f. The grade of service is the ratio of _____.

   **(A)** $\dfrac{\text{Traffic lost}}{\text{Traffic offered}}$        **(B)** $\dfrac{\text{Traffic offered}}{\text{Traffic lost}}$

   **(C)** $\dfrac{\text{Traffic carried}}{\text{Traffic offered}}$        **(D)** $\dfrac{\text{Number of calls arrived}}{\text{Number of calls lost}}$

g. The number of outgoing trunks to which an incoming trunk can obtain connection is called _____

(A) Connectivity                      (B) Congestion
(C) Traffic                           (D) Availability

h.  Number of minimum cross points required for a 3 stage network with M incoming trunks and N outgoing trunks is
_____.

(A) $C = 2N(N+M)$                     (B) $C = 2N(\sqrt{N+M})$
(C) $C = N(\sqrt{N+M})$               (D) $C = 4N\sqrt{N+M}$

i.  During signal exchange time, Proceed to send signal originates from _____.

(A) Calling terminal                  (B) Exchange Switching System
(C) Called terminal                   (D) Calling and called terminal

j.  Minimum number of Central processor required in SPC Switching System is _____.

(A) 1                                 (B) 2
(C) 3                                 (D) 4

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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 basic functions of a Switching System.                      **(8)**

b.   In a 1000 line strowger exchange using 1000 uniselector.  Show the trunking diagram when subscriber 254 establishes connection to subscriber 821.                      **(8)**

**Q.3**  a.  Define the following :

(i)  Busy hour                        (ii)  Grade of Service
(iii) Full availability               (iv)  Traffic Erlang                      **(8)**

b.   During busy hour 1500 calls were offered to a group of trunks and 5 calls were lost.  The average call duration is 3 minutes.  Find

(i)  Traffic offered                  (ii)  Traffic carried
(iii) Traffic lost                    (iv)  Grade of Service
(v)  Total duration of period of congestion.                      **(8)**

**Q.4**  a.  Explain with the help of diagram

(i)  Skipped grading                  (ii)  Homogeneous grading                      **(8)**

b.  Design a 3 stage network for connection of 100 incoming and 400 outgoing trunks.        **(8)**

**Q.5**  a.  With neat sketch explain the functioning of space switch.                      **(8)**

b.  Explain the working of T-S-T switching network.                      **(8)**

**Q.6**  a.  What are the sequences of operations of call processing function?  Explain briefly.        **(10)**

    b.  Explain load sharing and synchronous operation configuration of SPC system.    **(6)**

**Q.7**  a.  What is multiframing?  Explain 30-channel PCM system briefly.    **(8)**

    b.  With block diagram explain briefly CCITT signalling system number 7.    **(8)**

**Q.8**  a.  Write a note on ALOHA protocol.    **(8)**

    b.  Compare BUS and RING LAN topologies.    **(8)**

**Q.9**  a.  Explain briefly ISDN.    **(8)**

    b.  With neat sketch explain the principle of cellular mobile networks.    **(8)**