ROLL NO. _____

Code: DE62 Subject: TELECOMMUNICATION SWITCHING SYSTEMS

DipIETE – ET

Time: 3 Hours **DECEMBER 2012** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

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. In a folded network with N subscribers, the maximum number of simultaneous calls or information interchanges is

(A) N **(B)** N/2
(C) N^2 **(D)** 2N

b. During the busy hour, 1200 calls were offered to a group of trunks and 6 calls were lost. The average call duration was 3 minutes. The grade of service is

(A) 66.67 **(B)** 1.11
(C) 0.005 **(D)** 6.67

c. Cost Capacity Index (CCI) for a NxN time division switch is

(A) N **(B)** N/2
(C) N/4 **(D)** N/3

d. Which of following signals is provided to the exchange when each customer replaces the handsets

(A) Address Signal **(B)** Clear Signal
(C) Answer Signal **(D)** Status Signal

e. The beginning and end of each high level data link control (HDLC) message is indicated by a unique combination of digits known as

(A) Flag **(B)** Start
(C) Stop **(D)** Frame

f. PSPDN stands for

(A) Public Switched Packet data Network
(B) Private Switched Packet data Network
(C) Packet Switched Public data Network
(D) Packet Switched Packet data Network

g. The letter 'O' and 'H' in BOPSCHT stands for

(A) Ordinary control and hybrid
(B) Overvoltage protection and hybrid
(C) Overvoltage control and hybrid
(D) Overvoltage system and high speed switching.

h. For a given grade of service, if the offered traffic A increases, then the number of trunks N must

(A) Increase **(B)** Remain Constant
(C) Decrease **(D)** Be independent of A

i. Which of the following will become difficult in Bus Network

(A) Additional Nodes **(B)** Twisted Pair Cable
(C) Reliability **(D)** Fault Isolation

j. Circuit switching is an example of

(A) Queuing System **(B)** Blocking System
(C) Lost Call System **(D)** Non Blocking System

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

Q.2 a. Explain the functions of a switching system. **(8)**

b. In 1000 Line strowger exchange using 1000 uniselector. Show trunking diagram when 254 establishes connection to subscriber 822. **(8)**

Q.3 a. Compare Progressive grading and Homogeneous grading. **(8)**

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

Q.4 a. Explain the working of a basic time division time switching with the help of a block diagram. **(10)**

b. Calculate the number of trunks that can be supported on a time multiplexed space switch, given that
(i) 32 channels are multiplexed in each stream
(ii) Control memory access time is 100 ns
(iii) Bus switching and transfer time is 100 ns per transfer. **(6)**

Q.5 a. Define the following terms:
(i) Reliability (ii) Availability
(iii) Security of switching system. **(8)**

b. Draw the state transition diagram for a local call with explanation. **(8)**

Q.6 a. With the help of block diagram, explain the CCITT number 6 signalling scheme. **(8)**

b. Explain and compare Inband (VF) signalling and Outband signalling. **(8)**

Q.7 a. Explain the principle of ATM switches. **(10)**

b. An ATM network uses transmission links that operate at 150 Mbits/second and have a propagation delay of 5 μs per Km. It uses cells of length 53 octets, consisting of a 5-octet header and a 48 bit information field. The maximum delay introduced by a Switching centre is 300 cells. Find the maximum delay encountered by a telephone call over a connection of length 500 Km that passes through six switching centres. **(6)**

Q.8 a. Explain the Integrated Digital Network (IDN) with suitable diagrams. **(10)**

b. Explain Private Networks used by multinational companies. **(6)**

Q.9 a. Derive an expression for the probability of queuing system. **(8)**

b. Write short note on:-

(i) Queues in tandem.
(ii) Delay tables and its applications. **(8)**