Code: DE62   Subject: TELECOMMUNICATION SWITCHING SYSTEMS

DipIETE – ET (NEW SCHEME)

Time: 3 Hours   **JUNE 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. The ideal Grade-of-service in telephone system is

(A) 0   **(B)** 15
(C) 1   **(D)** 3

b. Space division switching system belongs to _____ system

(A) Manual   **(B)** Electromechanical
(C) Analog   **(D)** SPC

c. The letter B and S in BORSCHT stands for

(A) Battery feed and supervisory signal
(B) Battery feed and security
(C) Bus Voltage and signal voltage
(D) Busy line and supervision

d. Telephone traffic intensity is measured by _____

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

e. The larger is the grade of service _____ is the system

(A) Better   **(B)** No change
(C) Worse   **(D)** None

f. Basic Rate access type of ISDN require a bit-rate of _____

(A) 64 Kbits/sec   **(B)** 144 Kbits/sec
(C) 1.5 Mbits/sec   **(D)** 2 Mbits/sec

g. Output controlled Time division space switch uses _____ for outlets.

(A) Cyclic control selection   **(B)** Control memory based
(C) Random memory based   **(D)** None

h. In SPC System, if two processors are configured to work independently then it is known as _____

(A) Worker & standby   (B) Load sharing
(C) Synchronous   (D) None

i. In FDM system the carriers are spaced at intervals of _____ KHz.

(A) 8   (B) 4
(C) 16   (D) 2

j. The 2Mbps PCM system has_____ 8bit time slot.

(A) 32   (B) 30
(C) 28   (D) 34

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

Q.2 a. Explain briefly various classification of switching systems.   **(8)**

b. Design a 10,000 line exchange and show the connection between subscriber 6785 to 8954.   **(8)**

Q.3 a. Derive an expression for grade of service of a loss system with N full availability Trunks offered A erlangs of Traffic.   **(10)**

b. A message Switching center sends messages on an outgoing circuit at the rate of 460 characters per second. The average number of characters per message is 23 and the message length have a exponential distribution. The Input of messages is a Poison process and they are served in order of arrival. How many messages can be handled per second if the mean delay is not to exceed 0.5 second?   **(6)**

Q.4 a. What is grading? Show the various arrangements of Progressive grading for 4 group grading for 20 Trunks with availability = 10.   **(8)**

b. Derive an expression for minimum number of Cross points required for 3 stage network.   **(8)**

Q.5 a. With neat diagram explain input controlled Time division space switch.   **(8)**

b. Calculate the number of Trunks that can be supported on a Time multiplexed space switch given that   **(4)**
(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.

c. Draw the block diagram of TSI Switch.   **(4)**

Code: DE62   Subject: TELECOMMUNICATION SWITCHING SYSTEMS

Q.6   a. Draw signal exchange diagram for local calls and explain briefly.   **(8)**

b. Explain briefly various types of processor architecture of SPC system.   **(8)**

Q.7   a. With neat diagram explain briefly out band signalling system.   **(8)**

b. With block schematic explain CCITT no.7 signalling system.   **(8)**

Q.8   a. Explain the principle of Packet Switching.   **(8)**

b. An ethernet operates at 10 Mbps. It is 1 Km in length and velocity of propagation time is 2×10^8 m/s. Data packets consists of 512 bits including a 64 bit overhead. A receiving terminal takes the time of one bit to access the channel in order to send an acknowledgement signal which consists of an empty packet. If there are no collisions, at what rate can the system convey data?   **(8)**

Q.9   a. With neat diagram explain Integrated digital network briefly.   **(8)**

b. Write a short notes on:

(i)   Intelligent Networks
(ii) Private Networks   **(8)**