DipIETE – ET (OLD SCHEME)

Code: DE20 **Subject: ELECTRONIC SWITCHING SYSTEMS**
Time: 3 Hours **Max. Marks: 100**

JUNE 2009

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.**

Q.1 A Choose the correct or the best alternative in the following: **(2×10)**

a. The lowest level network in the data network is:

(A) Metropolitan area network
(B) Local area network
(C) Wide area network
(D) Wi-Fi network

b. POTS stands for

(A) Public operated Telephone System
(B) Post Office Telegraph System
(C) Plain old telephone system
(D) Packet operation telephone system

c. In a strowger exchange subscriber is generally connected to:

(A) Two motion selector **(B)** Uniselector
(C) Line relay **(D)** Multiselector

d. Common control requires:

(A) A separate channel **(B)** The data channel
(C) Both voice and data channel **(D)** None of the above

e. The 8 bit PCM VF channel requires a frame of:

(A) 2 microsec **(B)** 64 microsec
(C) 20 microsec **(D)** 125 microsec

f. The time taken for the two phase operation is given by:

(A) $Ts = Nt_d + N (t_d+t_c)$ **(B)** $Ts = t_d + N (t_d+t_c)$
(C) $Ts = Nt_d + Nt_c$ **(D)** $Ts = Nt_d + (t_d+t_c)$

g. In DTMF touch tone pad, the combination of frequencies 1209 Hz and 770 Hz is used to transmit digit:

(A) 0 **(B)** 2
(C) 1 **(D)** 4

h. In a non blocking network the cross points should be

(A) (n–1)N **(B)** n(N–1)
(C) nN **(D)** n(N+1)

i. MAC address is used for

(A) multimedia access control **(B)** media access control
(C) mobile access control **(D)** master access point control

j. ISO/OSI reference model for computer network is

(A) Five layered model **(B)** Seven layered model
(C) nine layered model **(D)** consists of tables

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

Q.2 a. Classify switching systems and explain the importance of trunking. **(8)**

b. Explain the importance of Grade of service and Blocking Probability. Over a 20 minute observation interval, 60 subscribers make calls. Total duration of calls is 5000 seconds. Calculate the load offered to the network by the subscribers and the average subscriber traffic. **(8)**

Q.3 a. What is input controlled time division space switch, explain how this enhances the Performance. **(8)**

b. List out and explain the function of various basic circuits used for selector control in switching stages. **(8)**

Q.4 a. Draw the schematic and explain the working of a DTMF instrument. **(8)**

b. Explain how 30 voice frequency channels are transmitted using a 125 microsecond PCM frame. **(8)**

Q.5 a. Draw n-stage time and space combination switching system and show how blocking can be reduced by this design concept. **(8)**

b. Design a three stage network for 100 incoming and 200 outgoing trunks indicate the configuration and number of cross points required. Draw the configuration. **(8)**

Q.6 a. How SPC helps in enhanced services, explain with examples. **(8)**

b. What does grade of service and blocking probability signify in a switching network and how are these taken care of. **(8)**

Q.7 a. What are the effects of delay, explain how delays are taken care of in telephone Networks. **(8)**

b. What is the advantage of common channel signalling, how this is implemented. Draw the signalling message format for Single Unit Message (SUM). **(8)**

Q.8 a. What are the major differences between voice and data traffic. Explain briefly the switching techniques used for data transmission. **(8)**

b. Explain the importance of Presentation layer in data communication. **(8)**

Q.9 Write short notes on any **TWO** of following: **(8 × 2 = 16)**

(i) State transition diagram.
(ii) Concentrators.
(iii) Subscriber loop system.