

JUNE 2008

Code: DE20

Subject: ELECTRONIC SWITCHING SYSTEMS

Time: 3 Hours

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.
 - 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 A Choose the correct or the best alternative in the following: (2x10)

- a. Engaged tone is generated in the:
- (A) Telephone instrument of calling subscriber
 (B) Telephone instrument of called subscriber
 (C) Exchange
 (D) Repeater
- b. One Erlang is equal to
- (A) 3600 CCS
 (B) 36 CCS
 (C) 60 CCS
 (D) 24 CCS
- c. The analog signal needs to be sampled at a minimum sampling rate of
- (A) $2f_s$ (B) $1/(2f_s)$
 (C) $f_s/2$ (D) $2/f_s$
- d. In a time division space switch the size of the control memory is N and its Width:
- (A) $\log_{10} M$ (B) $\log_e M$
 (C) $\log_N M$ (D) $\log_2 M$
 where N are the outlets and M the number of data samples
- e. In a single stage network:
- (A) There is no redundancy
 (B) There is redundancy
 (C) Alternative crosspoints are available
 (D) Alternative paths are available

- f. Signaling transfer point (STP) exist in
- (A) Strowger exchange (B) SS7
(C) Local area network (D) PABX
- g. ARQ is transmitted in the event of:
- (A) Loss of signal (B) Error in received data
(C) Improve reliability (D) During time out
- h. Computer to computer communication is:
- (A) Simplex (B) Duplex
(C) Half Duplex (D) Both Duplex and Half Duplex
- i. A distributed network configuration in which all data/information pass through a central computer is
- (A) Bus network (B) Star network
(C) Ring network (D) Point to point network
- j. An important terminal that is required between DTE and PSTN is
- (A) Server (B) MODEM
(C) Relay (D) Network card

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

- Q.2** a. Describe the nature of signals produced on the subscriber's loop by a pulse dialer, and a touch tone dialer. (8)
- b. Draw a 100 line exchange using two motion selectors and explain, how switching takes place in it. (8)
- Q.3** a. List the major difference in Single Stage, Two Stage and Three Stage Networks. Also discuss their blocking characteristics. (8)
- b. How time slot interchange switch works in time multiplexed time switching, explain using schematic. (8)
- Q.4** a. What are different control function categories, explain how they help in signalling and control. (8)

- b. Explain the following: **(8)**
(i) Busy Hour (ii) Peak Busy Hour
(iii) Time consistent Busy Hour (iv) Traffic intensity
- Q.5** a. Explain the principles of operation of centralized SPC and distributed SPC and compare their performance. **(8)**
b. Draw the schematic of a CCS and explain, giving its advantages. **(8)**
- Q.6** a. What is the difference between message switching and packet switching, explain typical packet switching network configuration. **(8)**
b. Explain CSMA/CD and CSMA/CA protocols used in LAN's, discuss its advantages and limitations. **(8)**
- Q.7** a. Describe the architecture of SS7 common channel signaling network with the help of a neat labeled diagram. **(8)**
b. Define congestion and grade of service. In a particular exchange during busy hour 900 calls were offered to a group of trunks, during this time 6 calls were lost. The average call duration being 3 minutes. Calculate:
(i) Traffic offered in erlangs (ii) Traffic lost
(iii) Grade of service (iv) Period of congestion **(8)**
- Q.8** a. Explain how presentation layer helps in establishing and processing data in End to End layers. **(8)**
b. Explain the need of network and channel graphs in designing a multistage network giving examples. **(8)**
- Q.9** Write short notes on: **(4x4)**
(i) DTMF
(ii) Numbering plan
(iii) OSI layer
(iv) Topologies used in networking