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

JUNE 2011

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. _____ Network Technology has all devices attached to a common backbone or trunk.

(A) BUS **(B)** RING
(C) STAR **(D)** MESH

b. If the carrier is sinusoidal and the baseband voltage level is used to vary the frequency or phase of the carrier , the modulation is known as

(A) FSK **(B)** ASK
(C) QAM **(D)** DPSK

c. A centralised SPC configuration

(A) uses one processor only
(B) uses more than one processor
(C) have control function not shared by processor
(D) none of the above

d. Average busy hour calls is

(A) BHCA + CCR **(B)** BHCA / CCR
(C) $(BHCA)\times(CCR)$ **(D)** CCR/ BHCA
BHCA = Busy Hour Call Attempt CCR= Call Completion Rate

e. The process of first compressing and then expanding is referred as

(A) companding **(B)** compression
(C) quantisation **(D)** sampling

f. If TDM stream of M sample per frame and t_s is the switching time then the no. of trunks that can be supported on Time multiplexed space switch is

(A) $N = 125/Mt_s$ **(B)** $N = 125\,Mt_s$
(C) $N = Mt_s$ **(D)** $N = 125/t_s$

g. The traffic in telecommunication network is measured by unit known

(A) Hz
(B) Byte per sec
(C) Busy hour
(D) Erlang

h. Call is switched through, to the desired direction in cross bar exchange is in

(A) preselection stage
(B) line selection stage
(C) group selection stage
(D) none of these

i. Distances near the skip distance should be used for sky wave propagation

(A) to avoid filtering
(B) to prevent sky and upper ray interference
(C) to avoid faraday effect
(D) so as not to exceed the critical frequency

j. The routing tone is a

(A) 400 Hz or 800 Hz intermittent pattern
(B) Bursty 400 Hz signal with silent period in between
(C) 400 Hz continuous tone
(D) 400 Hz tone duration of 0.4s

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

Q.2 a. With the help of a block diagram, explain the configuration of a step-by-step switching system. **(6)**

b. Coaxial cable used in a transmission line has an inner radius of 0.25 mm and an outer radius of 0.75 mm. Calculate the characteristic impedance Z_0 of coaxial line. What is the range of Z_0 of coaxial lines? **(6)**

c. List the various signalling tones available on telephone exchange. **(4)**

Q.3 a. What is stored program control exchange? Compare centralized SPC with distributed SPC. **(8)**

b. What is return loss? Show that there will be no reflected signal if the two networks 4 wire circuits and 2 wire circuits are perfectly balanced **(8)**

Q.4 a. Discuss OSI reference model. Explain the functions of network layer. **(8)**

b. A CSMA/CD bus spans a distance of 1.5 Km. If data rate is 5 Mbps, what is minimum frame size when propagation speed in LAN cable is $200\,\text{m}/\mu\text{s}$. **(8)**

Q.5 a. What is Traffic Engineering? Define the term busy hour, traffic intensity and grade of service. **(8)**

b. During busy hour, 1200 calls were offered to a group of trunks and 6 were lost. The average call duration (holding time) was 3 minutes. Find
(i) traffic offered
(ii) traffic lost
(iii) grade of service
(iv) total duration of periods of congestion **(8)**

Q.6 a. Explain the working principle of Space and Time switches used in switching system. **(8)**

b. What is DTMF signalling? Draw and describe the layout of DTMF keypad. **(8)**

Q.7 a. What is Non-blocking networks? Compare it with blocking networks. **(8)**

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

Q.8 a. What is Common channel signalling? List the advantages of Common channel signalling. **(8)**

b. Discuss the various enhanced services that can be made available to the subscribers because of stored program control. **(8)**

Q.9 Write short note on the following:

(i) Processor Architecture **(6)**
(ii) Single Stage and Multistage Network **(6)**
(iii) Topology of CCN **(4)**