

Code: DE-20

Subject: ELECTRONIC SWITCHING SYSTEMS

JUNE 2007

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

a. Call request signal is:

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|--------------------------------|------------------------------------|
| (A) Seize signal | (B) Idle state signal |
| (C) Line identification signal | (D) Called subscriber alert signal |

b. Telephone Traffic is measured in

- | | |
|--------------|------------------------|
| (A) Seconds. | (B) Hours. |
| (C) Erlang. | (D) Pulses per minute. |

c. In step by step switching line finders are connected to the

- | | |
|-------------------------|------------------------|
| (A) Calling subscriber. | (B) Switching network. |
| (C) Called subscriber. | (D) Between exchanges. |

d. In a DTMF phone, digits are represented by:

- | | |
|-----------------------------|------------------------|
| (A) Orthogonal frequencies. | (B) Orthogonal Phases. |
| (C) Orthogonal codes. | (D) Orthogonal pulses. |

e. Companding helps in reducing _____ with respect to signal:

- | | |
|-------------------|------------------------|
| (A) Interference | (B) Signal overloading |
| (C) Non linearity | (D) Quantization noise |

f. SS7 Protocol uses:

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|--------------------------------|----------------------------|
| (A) Out of band signalling. | (B) Associated signalling. |
| (C) Speech control signalling. | (D) No signalling. |

g. MAC is the abbreviation for:

- | | |
|-------------------------------|--------------------------|
| (A) Multimedia access control | (B) Media access control |
|-------------------------------|--------------------------|

(C) Mobile access control

(D) Master access point control

h. The CCITT standard bandwidth for speech is:

(A) 20000 Hz

(B) 15000 Hz

(C) 7000 Hz

(D) 3400 Hz

i. Maximum channel utilization in a LAN is defined by frame time (t_f) and propagation time (t_p). It is defined by(A) t_p/t_f (B) t_f/t_p (C) $1 + (t_f/t_p)$ (D) $t_f/(t_p + t_f)$

j. The function of ARQ in a network protocol is to:

(A) Auto request

(B) Acknowledge

(C) Address request

(D) Abort

Answer any FIVE Questions out of EIGHT Questions.

Each question carries 16 marks.

Q.2 a. How does a touch tone receiver differs from pulsed dial receiver? Explain with schematic. (8)

b. How numbering plan is achieved in modern telephony? Give the structure with example. (8)

Q.3 a. What are the different ways of designing 100 line exchange using uniselector and two motion selectors. Show at least three variations. Which is the best option? (8)

b. What are transmission bridges? How do they help in satisfying the connectivity? (8)

Q.4 a. What are the major changes in a two stage, three stage and n-stage networks? Compare their blocking characteristics. (8)

b. Find the grade of service in a three stage network when a total of 30E is offered to a 10×10 switch. A total of 100 incoming, 100 intermediate and 100 outgoing links are being used. If there is an increase of 20% in secondary switches what will be the grade of service, comment on the result. (8)

Q.5 a. Explain FDM and show how CCITT standards help in building the base band? (8)

b. Draw a centralized SPC organization and explain how it works under load sharing operation. **(8)**

Q.6 a. Explain the process of inter-register signalling. **(8)**

b. Distinguish between in-channel and common channel signalling. Which is more advantageous and why? **(8)**

Q.7 a. What do you mean by numbering and addressing? Draw the ISDN address structure and explain how the addressing works? **(8)**

b. What are concentrators? Explain how it helps in connecting number of subscribers. **(8)**

Q.8 a. Describe briefly the OSI layers of a computer network and explain the importance of each of these in networking. **(8)**

b. Give the operation of different topologies used in local area network bring out their advantages and disadvantages. **(8)**

Q.9 Write short notes on:

(i) Quantization.

(ii) Non Blocking network.

(iii) Grade of service.

(iv) Data communication architecture.

(4 × 4)