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

NOTE: There are 9 Questions in all.

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- **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: (2x10)

a.   Traffic Handling Capacity is given by

   (A) Switching capacity $\times$ Theoretical maximum load

   (B) Switching capacity / Theoretical maximum load
   (C) Theoretical maximum load / Switching capacity
   (D) Theoretical maximum load + Switching capacity

b.   Traffic Intensity can be measured in

   (A) Erlangs   (B) CCS
   (C) CM   (D) All of the above

c.   Trunks are the lines that run between

   (A) Subscribers and exchange   (B) Switching system and power plant
   (C) Local area network   (D) Switching stations

d.   Packet switching is used for

   (A) Credit card verification
   (B) Automated Teller Machine
   (C) The internet and the World Wide Web
   (D) All of the above

e.   Analog signals can be _____ by combining them with a carrier frequency

   (A) Carried   (B) Transported
   (C) Multiplexed   (D) Mixed

f.   The Signalling connection control part (SCCP) and message transfer part (MTP) together are referred to as

   (A) Signal Switching Points (SSPs)
   (B) Signal Transfer Points (STPs)
   (C) Signal Control Points (SCPs)
   (D) Network service part (NSP)

B.   State True or False

g.   A two stage non-blocking network requires twice the number of switching elements as the single stage non-blocking network.

   (A) TRUE   (B) FALSE

h.   The larger the Grade Of Service, the worse is the service given

   (A) TRUE   (B) FALSE

i. A certain amount of side tone is essential in telephone communication

    (A) TRUE   **(B)** FALSE

j. Sky wave Communication is prone to fading

    (A) TRUE   **(B)** FALSE

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

Q.2   a.   Discuss the classifications of switching systems. In what way is stored program control superior to hard wired control?   **(8)**

    b. Discuss the various functions of telephone switching systems.   **(8)**

Q.3   a. With the help of a neat diagram explain the configuration of a step by step switching system   **(8)**

    b. Discuss the advantages of automatic switching systems over manual switching system.   **(8)**

Q.4   a.   Discuss the basic structure and principle of operation of Time Slot Interchange (TSI) switch with the help of a neat diagram.   **(8)**

    b. Explain the following design parameters
      S, SC, TC, C, CCI, EUF, K, T_S **(8)**

Q.5   a.   What are single stage and multistage networks? Compare the strengths and weaknesses of each.   **(8)**

    b. A three stage network is realized by using switching matrices of size **p x s** in stage 1, **r x r** matrices in stage 2 and **s x p** matrices in stage 3. Using the Lee's probability graph show that the Blocking Probability for the three stage network is given by

    $P_B = \left[1 - (1 - \alpha/k)^2\right]^s$ Where $k = s/p$ and $\alpha =$ Inlet utilization factor   **(8)**

Q.6   a. Explain SPC. Also discuss the different modes of Centralized SPC.   **(8)**

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

Q.7   a. With reference to telephone traffic, explain the following terms
      GOS, BHCA, CCR, BHCR   **(8)**

    b. A call processor in an exchange requires 120 ms to service a complete call. What is the BHCA rating for the processor? If the exchange is capable of carrying 700 Erlangs of traffic, what is the call completion rate? Assume an average call holding time of 2 minutes.   **(8)**

Q.8   a.   What are the advantages of Hierarchical Networks? Discuss the 5-level switching hierarchy recommended by CCITT.   **(8)**

    b. Compare In Channel and Common Channel Signalling.   **(8)**

Q.9   a.   What are End-to-End layers in ISO-OSI reference model? Explain briefly the function of each one of them.   **(8)**

    b. Explain various topologies and access methods used in Local-Area-Networks.   **(8)**