

**AMIETE – ET (Current & New Scheme)**

Time: 3 Hours

**June 2019**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**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. Read-electronic systems is implemented using the principal of  
 (A) Diode Switching (B) Manual Switching  
 (C) Magnetic Switching (D) Space Switching
- b. The traffic carried by a group of trunks is given by \_\_\_\_\_, where A = traffic in erlangs, C = average number of call arrivals during time T and h = average call holding time.  
 (A)  $A = \frac{Ch}{T}$  (B)  $A = \frac{CT}{H}$   
 (C)  $A = \frac{Th}{C}$  (D)  $A = ChT$
- c. In a two stage switching network, for a concentrator with M incoming trunks and N outgoing trunks are designed using m inlets primary switches and n outlets secondary switches, then number of cross points per secondary switch is  
 (A) M/m (B) mN/n  
 (C) N/n (D) nM/m
- d. In common control if \_\_\_\_\_ is free, then incoming seize signal is accepted.  
 (A) Arbiter (B) Tree network  
 (C) Crossbar (D) Trunking
- e. Systems within the baseband of FDM systems are known as  
 (A) Inband signaling system (B) Voice frequency signaling system  
 (C) Both (A) and (B) (D) None of these
- f. Generally in any optical-fiber LANs \_\_\_\_\_ is used.  
 (A) Bidirectional bus configurations (B) Unidirectional bus configurations  
 (C) Bidirectional ring configurations (D) Unidirectional ring configurations

- g. Which kind of switching technique indicates the transfer of coded values from input to output during the same interval of time?  
 (A) Time Switching (B) Space Switching  
 (C) Combination Switching (D) All of these
- h. In an  $N \times k$  space time space architecture with an array of  $k$  TSI switches in middle, required space matrix at output is  
 (A)  $N$  (B)  $N \times k$   
 (C)  $k$  (D)  $k \times N$
- i. A large numbers of computers in a wide geographical area can be efficiently connected using  
 (A) twisted pair lines (B) coaxial cables  
 (C) Communication satellites (D) All of these
- j. In basic time division space switching system digital bus is employed in  
 (A) Pulse Amplitude Modulation (PAM) (B) Frequency Modulation  
 (C) Pulse Code Modulation (PCM) (D) All of these

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

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- Q.2** a. Give a brief overview of digital switching system. (8)
- b. With the help of a diagram, explain the operation of general trunking for a switching system. (8)
- Q.3** a. Write a short note on any two (8)  
 (i) The Second Erlang Distribution  
 (ii) Probability of Delay  
 (iii) Finite Queue Capacity.
- b. In a telephone system the average call duration is 2 minutes. A call has already lasted 4 minutes. What is the probability that (4+4)  
 (i) the call will last at least another 4 minutes?  
 (ii) the call will end within the next 4 minutes?
- Q.4** a. With help of a diagram explain the principle, capacity and applications of Grading. (8)
- b. Design a three-stage network for 100 incoming trunks and 400 outgoing trunks. (8)

- Q.5** a. Write a short note about time multiplexed space switching. (8)
- b. Calculate the maximum access time that can be permitted for the data and control memories in a TSI switch with a single input and single output trunk multiplexing 2500 channels. Also, estimate the cost of the switch and compare it with that of a single stage space division switch. (8)
- Q.6** a. Explain the basic concepts of SPC. Compare Centralized SPC and Distributed SPC. (8)
- b. Briefly explain the function of common control system. (8)
- Q.7** a. What are the possible types of signaling used in inter-register signaling? (8)
- b. Using suitable diagram, show the relationship between CCITT no. 7 functional levels and layers of OSI seven layer models. (8)
- Q.8** a. Enlist the advantages of ATM switches in context with other switches. (8)
- b. A terminal is connected to a computer by a data link transmitting at 2.4 bit /s in each direction. On average, terminal user issues a request to the computer once per minute. The average length of a user message is ten 8-bit characters and the average length of the computer reply is 100 8-bit characters. The time taken by the computer to process the information and the propagation time of the link are negligible. Find;
- i) The average delay before the terminal has received a complete reply.
- ii) The occupancy of the data channel. (8)
- Q.9** Write short note on: (8+8)
- (i) Numbering plans for the ISDN
- (ii) Automatic alternative routing