

**DiplETE – ET**

Time: 3 Hours

**DECEMBER 2013**

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. Strowger Switching Components are \_\_\_\_\_
- (A) mechanical tooth and gear components  
(B) electrical components with coils  
(C) electronic components with semiconductor switches  
(D) electromechanical components
- b. Trunks are connections between\_\_\_\_\_
- (A) subscribers (B) switching systems  
(C) switching components (D) batteries
- c. The Unit of intensity of Traffic is measured in\_\_\_\_\_
- (A) calls per second (B) erlangs  
(C) hertz (D) percentage
- d. Erlang distribution estimates the\_\_\_\_\_
- (A) Number of simultaneous calls made to the switching system  
(B) Number of calls pending  
(C) Traffic availability  
(D) RMS Traffic
- e. If there are n links with a probability p that each link is busy, then the probability that all links are busy is given by\_\_\_\_\_
- (A)  $1/p^n$  (B)  $p^n$   
(C) n (D) np
- f. Queuing helps in\_\_\_\_\_
- (A) avoiding blocking (B) reducing the number of servers  
(C) smoothing out the traffic flow (D) avoiding congestion

- g. Multistage networks helps in using \_\_\_\_\_
- (A) cross points efficiently
  - (B) single cross point per connection
  - (C) network in non blocking mode
  - (D) less time for establishing a call
- h. Common Control can be achieved by \_\_\_\_\_
- (A) using different routes
  - (B) single channel
  - (C) uniform numbering scheme
  - (D) SPC
- i. PCM Signaling is a \_\_\_\_\_
- (A) common channel signaling.
  - (B) in-channel signaling
  - (C) associated signaling
  - (D) D.C. signaling
- j. Statistical Multiplexing is a \_\_\_\_\_
- (A) asynchronous multiplexing scheme
  - (B) 30 synchronous multiplexing scheme
  - (C) simple TDM
  - (D) simple FDM

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

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- Q.2** a. A 100 line exchange is to be designed using uniselectors and two motion selectors that provides a switching capacity of 20. Give your requirement of components and explain how will you implement this exchange scheme. (10)
- b. How trunking is useful in an telecommunication network? Explain typical trunking diagram? (6)
- Q.3** a. How will you characterise a typical telephone traffic model? What are the parameters considered for such a model? (6)
- b. What does Grade of Service indicate? In a telephone network there are 10 servers and 100 subscribers. During any time on an average 7 servers are busy. Calculate (i) the probability that all servers are busy and (ii) Grade of Service. (5)
- c. Draw the schematic of a Queuing system and explain its working. (5)

**Code: DE62      Subject: TELECOMMUNICATION SWITCHING SYSTEMS**

- Q.4** a. Explain how blocking probability reduces in a three stage switching network system? (10)
- b. A three stage network is designed with the following parameters:  
 $p=q=16$  and  $\alpha=0.7$ . Calculate the blocking probability of network for  $s=18$  and  $s=31$ . (6)
- Q.5** a. What is a Time Division Time switching system? Explain its modes of operation and how these modes help in determining the number of subscribers? (8)
- b. Calculate the number of trunks that can be supported on a time multiplexed space switch, that has 24 channels multiplexed in each stream. The memory access time is 80nsec and other process worst case is time 100nsec. (8)
- Q.6** a. Draw the typical centralized stored programme control organization and explain how can a dual processor architecture be configured to operate in (10)
- (i) Stand by mode
- (ii) Load sharing mode
- b. Given that MTBF is 1500 hours and MTTR is 5 hours then calculate the unavailability for (i) single processor and (ii) dual processor. (6)
- Q.7** a. What are the advantages of common channel signaling , draw the basic scheme for CCS and explain its principle of working. (8)
- b. Draw the architecture of SS7 and explain the importance of each layer. (8)
- Q.8** a. What is the need of packet switching when circuit switches exist? How statistical multiplexing is different from STDM? (8)
- b. Give four comparison of bus and ring networks. (8)
- Q.9** Write short notes on:
- (i) Private networks
- (ii) Charging in telecommunication network (8+8)