## DipIETE - ET

Time: 3 Hours

## DECEMBER 2013

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 $\mathbf{Q} .1$ 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:
a. Strowger Switching Components are $\qquad$
(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 $\qquad$
(A) subscribers
(B) switching systems
(C) switching components
(D) batteries
c. The Unit of intensity of Traffic is measured in $\qquad$
(A) calls per second
(B) erlangs
(C) hertz
(D) percentage
d. Erlang distribution estimates the $\qquad$
(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 $\qquad$
(A) $1 / p^{n}$
(B) $p^{n}$
(C) n
(D) np
f. Queuing helps in $\qquad$
(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 $\qquad$
(A) using different routes
(B) single channel
(C) uniform numbering scheme
(D) SPC
i. PCM Signaling is a $\qquad$
(A) common channel signaling.
(B) in-channel signaling
(C) associated signaling
(D) D.C. signaling
j. Statistical Multiplexing is a $\qquad$
(A) asynchronous multiplexing scheme
(B) 30 synchronous multiplexing scheme
(C) simple TDM
(D) simple FDM

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.
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?
Q. 3 a. How will you characterise a typical telephone traffic model? What are the parameters considered for such a model?
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.
c. Draw the schematic of a Queuing system and explain its working.
Q. 4 a. Explain how blocking probability reduces in a three stage switching netwo system?
b. A three stage network is designed with the following parameters:
$\mathrm{p}=\mathrm{q}=16$ and $\alpha=0.7$. Calculate the blocking probability of network for $\mathrm{s}=18$ and $\mathrm{s}=31$.
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?
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 80 nsec and other process worst case is time 100 nsec .
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.
Q. 7 a. What are the advantages of common channel signaling , draw the basic scheme for CCS and explain its principle of working.
b. Draw the architecture of SS7 and explain the importance of each layer.
Q. 8 a. What is the need of packet switching when circuit switches exist? How statistical multiplexing is different from STDM?
b. Give four comparison of bus and ring networks.
Q. 9 Write short notes on:
(i) Private networks
(ii) Charging in telecommunication network

