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 system is a
(A) Step by step switching system
(B) Cross point system
(C) Electronic switching system
(D) Digital switching system
b. Erlang is a unit to measure
(A) Number of users
(B) Number of calls connected during busy hour
(C) Success rate of calls
(D) Traffic
c. Grading defines
(A) The throughput within a specified time
(B) The quality of the circuit
(C) The number switching that takes place before call is connected
(D) The speed of connectivity
d. The number of cross points in a diagonal cross point matrix is given by
(A) $\mathrm{N}^{2} / 4$
(B) N
(C) $\mathrm{N}(\mathrm{N}-1) / 2$
(D) $\mathrm{N}(\mathrm{N}-2) / 2$
e. In a T-S-T 20 input and 30 input links with a occupancy of 0.623 E will have traffic capacity of
(A) 963 E
(B) 600 E
(C) 374 E
(D) 0.934 E
f. State transition diagram helps in
(A) Determining the stability
(B) Defining behaviour of a system
(C) Arriving at number of switches required
(D) Arriving at Boolean expression
g. Trunk circuits are used to
(A) Provide sharing of channels by many users
(B) Number of exchanges required
(C) Connect many Switches
(D) Provide Data communication
h. Common channel signalling helps in
(A) Using separate channels for common bearers
(B) Providing signalling information to many bearers
(C) Reducing the number of channels
(D) Congestion
i. ISDN uses signalling system
(A) SS16
(B) SS7
(C) SS 5
(D) SS2
j. Link to Link layer comprises of
(A) Physical, Data and Network layer
(B) Application, Presentation and session
(C) Network, Transport and Data
(D) Session, Transport and Network

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

Q. 2 a. Draw the schematic of a 1000 line strowger switching system and explain how subscribers get connected.
b. Explain the various design parameters of a switching system.
c. What are the advantages of a digital system over electromechanical system?
Q. 3 a. What is the need to estimate the traffic in an exchange, how is it arrived at?
b. A switching system serves 10000 subscribers with a traffic intensity of 0.2 Erlangs per subscriber. If the traffic increases by $40 \%$, what is the effect on the arrival rate?

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c. What are the assumptions taken into account while arriving at a queuin Explain the need of finite Queuing and how this capacity is arrived at.

Q4 a. Define the following:
(i) Traffic capacity
(ii) Grade of service
(iii) Non Blocking network
b. Draw the schematic of a two stage network and explain its operation in providing reliable switching.
c. Design a three stage network that has 100 incoming line and 300 outgoing trunks. Also calculate the total cross points.
Q. 5 a. Distinguish between Time division space switching and Space division time switching.
b. What are synchronisation networks? Draw schematic of synchronisation hierarchy of an integrated digital network.
c. What is the role of concentrators in a switching network?
Q. 6 a. How call processing takes place in a switching system? Explain with example.
b. What is store program control? Give the organization of centralized SPC. Discuss the advantages of SPC automation in telephone switching.
c. What are application programs that run on an operating system?
Q. 7 a. What are the various types of signalling used in a switching network?
b. Explain the various levels of CCITT signalling system number 7.
c. Describe High level Data link control protocol.
Q. 8 a. How frame relay is different from X25 packet switching?
b. What are the various network topologies? Compare the ring configuration with bus configuration.
c. Explain the features of ATM and explain the principle of an ATM switch.
Q. 9 Write short notes on:
(i) Numbering Plans for the ISDN Era.
(ii) PDN
(iii) Numbering Plan
(iv) Automatic Alternate Routing

