

AMIETE – ET

Time: 3 Hours

DECEMBER 2014

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. The ISDN provides services using _____ digit streams
- (A) 8 kbits/s (B) 16 kbits/s
(C) 32 kbits/s (D) 64 kbits/s
- b. What is traffic offered if 6 calls are lost out of 1200 calls offered to a group of trunks having average duration of 3 minutes
- (A) 30E (B) 60E
(C) 80E (D) 120E
- c. The number of crosspoints required for single stage networks
- (A) $\frac{N^2}{2}$ (B) $N(2n+N)n$
(C) $\frac{1}{2}N(N-1)$ (D) $2N^{3/2}$
- d. Erlang is a unit to measure
- (A) Number of users (B) Number of calls connected
(C) Success rate of calls (D) Traffic
- e. Strowger system is
- (A) Step by step system (B) Crosspoint system
(C) Electronic switching system (D) Digital switching system

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f. In a TST 20 input and 30 input links with occupancy of 0.623E will have traffic capacity

- (A) 0.934E (B) 374 E
(C) 600 E (D) 963 E

g. Common channel signalling helps in

- (A) Using separate channels for common bearers
(B) Application, Presentation and session
(C) Network, Transport and Data
(D) Session, Transport and Networks

h. Availability of processor in SPC system is

- (A) $\frac{MTTF}{MTTR}$ (B) $\frac{MTTR}{MTTF}$
(C) $\frac{MTTF}{MTTF + MTTR}$ (D) $\frac{MTTR}{MTTF + MTTR}$

i. The Poisson distribution formula for call arrived

- (A) $p(x) = \frac{A^x}{x!} e^{-A}$ (B) $p(x) = \frac{x^T}{x!} e^{-T}$
(C) $p(x) = \frac{u^x}{x} e^{-u}$ (D) $p(x) = \frac{C^x e^{+x}}{x!}$

j. The total number of bytes in ATM cell is

- (A) 56 bytes (B) 50 bytes
(C) 53 bytes (D) variable

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

Q.2 a. Explain the functions of a switching system. (8)

b. What are design parameters of a switching system? Explain 100 line step by step switching system. (8)

Q.3 a. Explain the mathematical model of the traffic offered to telecommunication system. (8)

b. A group of five trunks is offered 2E of traffic. Find : (8)
(i) Grade of service
(ii) Probability that only one trunk is busy
(iii) Probability that only one trunk is free
(iv) Probability that at least one trunk is free

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- Q4** a. What is meant by link systems? Explain two stage networks in detail. (8)
- b. Design a three stage Network for 100 incoming trunks and 400 outgoing trunks. (8)
- Q.5** a. Explain three-stage combination switching and give the expression for blocking probability of a TST switch. (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. Give the characteristics of micro programmed and hand wired control schemes. (6)
- b. Explain the basic symbols defined for use in state transition diagram. (4)
- c. Explain signal exchange diagram for local call. (6)
- Q.7** a. Explain the meaning of following terms applied to inter register signalling: (8)
- (i) En-block signalling
 - (ii) overlap signalling
 - (iii) link by link signalling
 - (iv) end to end signalling
- b. What is common channel signalling? Give its advantages. (8)
- Q.8** a. Explain the difference between a circuit switched and a packet switched network and discuss their relative merits. (6)
- b. A pure ALOHA system uses a 56 kbit/s channel. On average each terminal originates a 1024 bit packet every seconds. How many terminals can the system accommodate? (6)
- c. Explain the basic functions of an ATM switch. (4)
- Q.9** a. Explain the intelligent network architecture. (8)
- b. Explain the principles determining a national numbering plan. How is this influenced by the need for an international number plan? (8)