ROLL NO. _____

Code: AE64/AE115 Subject: TELECOMMUNICATION SWITCHING SYSTEMS

AMIETE – ET (Current & New Scheme)

Time: 3 Hours **December 2016** **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 CCITT standard bandwidth for speech is _____.
(A) 3000 Hz **(B)** 3400 Hz
(C) 3600 Hz **(D)** 4000 Hz

b. The technology that can be easily adapted for expansion in an organization is
(A) ATM LAN **(B)** ATM WAN
(C) ATM MAN **(D)** All of these

c. In a frame transmission, CRC stands for
(A) Code Renewable Check **(B)** Cyclic Redundancy Check
(C) Control and Refresh Code **(D)** Cyclic Refreshing of CPU

d. MTP is divided into _____ functional levels
(A) 1 **(B)** 2
(C) 3 **(D)** 1 or 2 or 3 Depending on network

e. The _____ is used to carry the signal information between user parts.
(A) Fill In Signal Unit (FISU) **(B)** Link Status Signal Unit (LSSU)
(C) Message Signal Unit (MSU) **(D)** Data carry link

f. In analyzing the traffic performance, how is the number of trunk decided with the provision of the Grade of Service (GoS) especially for larger group?
(A) By normal load condition **(B)** By overload condition
(C) By underload condition **(D)** None of these

g. Telephone Traffic is measured in _____.
(A) MBPS **(B)** Hours
(C) Erlang **(D)** Pulses per minute

h. Only one packet for each destination is allowed at each tick; if there is more than one, they wait for the next tick in
(A) time-space-time switch **(B)** Banyan switch
(C) Batcher-banyan switch **(D)** crossbar switch

i. Common channel signalling in CCITT SS7 is _____.
(A) speech control channel **(B)** in band control channel
(C) out band control channel **(D)** None of these

j. A dual processor architecture may be configured to operate in _____.
(A) Standby mode **(B)** Synchronous duplex mode
(C) Load sharing mode **(D)** All the these

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

Q.2 a. With help of elemental block diagrams explain briefly basic operations of any switching system. **(8)**

b. Given that MTBF = 2000 hrs and MTTR = 4 hrs. Calculate the unavailability for single and dual processor systems for 10 years and 30 years. **(8)**

Q.3 a. On average, one call arrives every 10 seconds. During a period of one minute, what is the probability that
(i) no call arrives? **(2)**
(ii) one call arrives? **(2)**
(iii) more than three calls arrive? **(4)**

b. Write a short note on CRC. **(8)**

Q.4. a. Design a three-stage network for 100 incoming trunks and 400 outgoing trunks. **(8)**

b. Briefly describe the basic function of the different layer of message transfer part. **(8)**

Q.5 a. (i) Calculate the maximum permitted access time for the data and control memories in a TSI switch with a single input and single output trunk multiplexing 1250 channels and also compare its cost with a single stage space division switch. **(5)**

(ii) Calculate the number of trunks that can be supported on a time multiplexed space switch for 32 channels. Assume that memory access time, bus switching and transfer time/transfer are 100ns each. **(3)**

b. Explain Call management features of ISDN. **(8)**

Q.6 a. (i) Explain briefly the basic concepts of SPC. **(5)**

(ii) List few advantages and disadvantages of SPC over other types of controls. **(3)**

b. Design a strictly non-blocking network for 1000 incoming and 1000 outgoing trunks. Also, calculate the total cross points. **(8)**

Q.7 a. Briefly describe the operation of DTMF. **(8)**

b. Compare the strengths and weaknesses of single stage and multistage networks. **(8)**

Q.8 a. Discuss various advantages of ATM. **(8)**

b. What is congestion? Explain the two types of congestion. In which condition both are same? **(2+4+2)**

Q.9 a. Briefly explain different problems and issues that network designers must consider. **(8)**

b. What are the unique features of cross bar switches? **(8)**