ROLL NO. _____

Code: AE64/AE115 Subject: TELECOMMUNICATION SWITCHING SYSTEMS

AMIETE – ET (Current & New Scheme)

Time: 3 Hours **DECEMBER 2015** **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 number of point to point links required in a fully connected network for the 50 entities is _____.
(A) 1250 **(B)** 1225
(C) 2500 **(D)** 50

b. Telephone companies normally provide a voltage of _____ to power telephones.
(A) +24 volts DC **(B)** -24 volts DC
(C) +48 volts DC **(D)** -48 volts DC

c. The situation when both transmitter and receiver have to work in tandem is referred to as _____.
(A) Parallel **(B)** serial
(C) synchronous **(D)** asynchronous

d. Common Channel signaling _____.
(A) uses the speech or data path for signaling
(B) does not use the speech or data path for signaling
(C) needs no additional transmission facilities.
(D) finds it difficult to handle signaling during speech

e. A large numbers of computers in a wide geographical area can be efficiently connected using _____.
(A) twisted pair lines **(B)** coaxial cables
(C) communication satellites **(D)** All of these

f. Which transmission mode is used for data communication along telephone line?
(A) parallel **(B)** serial
(C) synchronous **(D)** asynchronous

g. A sample rate of _____ is required for a good quality representation of telephone conversation.
(A) 4500 times per second
(B) 700 integer sample points per minute
(C) 50 times per second per mile of distance travelled
(D) 8000 times per second

h. The _____ is a circuit-switched network, while the _____ is a packet-switched network.
(A) telephone, ATM **(B)** SONET and FDDI
(C) satellite, telephone **(D)** FDDI and SONET

i. A master group consists of
(A) 12 voice channels **(B)** 24 voice channels
(C) 60 voice channels **(D)** 300 voice channels

j. Erlang is used to
(A) measure busy period **(B)** give total busy period in minutes
(C) measure average call rate **(D)** indicate total call period

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

Q.2 a. With neat diagrams explain the configuration of a step-by-step switching system. **(8)**

b. What is Store Program Control (SPC)? Give the organization of centralized SPC. Discuss the advantages of SPC automation in telephone switching. **(8)**

Q.3 a. What is time division switching? **(6)**

b. Define grade of services. In a particular exchange during busy hour 1200 calls were offered to a group of trunks, during this time 6 calls were lost. The average call duration being 3 minutes, calculate: **(10)**
(i) Traffic offered in erlangs
(ii) Traffic lost
(iii) Grade of service
(iv) period of congestion

Q.4 a. What are the different tones used in strowger telephony? Explain with help of waveform and Timing diagram. **(8)**

b. What are the single stage and multistage networks? Compare the strengths and weaknesses of each of them. **(8)**

Q.5 a. How does the one arrive at the probability of availability of free lines during the busy hour? How can this be improved? **(8)**

b. Explain all the categories that are served by common control switching system. **(8)**

Q.6 a. Explain the working of broadband ISDN **(8)**

b. What is the need of hybrid in telephone networks? How does it work? **(8)**

Q.7 a. Name the switching schemes used in a digital exchange. How call processing takes place? **(8)**

b. How speech is transmitted in a digital switching environment using PCM/TDM? **(8)**

Q.8 a. What are the various types of signalling used in a switching network? **(8)**

b. Calculate the number of trunks that can be supported on a time multiplexed space switch given that, 32 channels are multiplexed in each stream, while the control memory access time is 100ns and the bus switching transferring time is 100ns per transfer. **(8)**

Q.9 a. Explain the various levels of CCITT signalling system number. **(8)**

b. Write short notes on **(2x4)**
(i) Stored program control (ii) Congestion
(iii) Common channel signalling (iv) PSTN