Code: AE64/AE115   Subject: TELECOMMUNICATION SWITCHING SYSTEMS

AMIETE – ET (Current & New Scheme)

Time: 3 Hours   **JUNE 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.   Traffic Capacity is given by _____

   (A) Switching capacity × Theoretical maximum load
   (B) Switching capacity / Theoretical maximum load
   (C) Theoretical maximum load / switching capacity
   (D) Theoretical maximum load × Switching capacity of these

b.   No. of point-to-point links required to connect five entities _____

   (A) 10   **(B)** 15
   (C) 5   **(D)** 20

c.   The links that run between switching system and subscriber premises is known as _____

   (A) Subscriber lines   **(B)** Cables
   (C) Wires   **(D)** Trunks

d.   Step-by-step switching system is also known as _____

   (A) Strowger   **(B)** Electronic
   (C) Electromechanical   **(D)** Space

e. Common channel signalling_____

   (A) Uses the speech or data path for signalling
   (B) Does not use the speech or data path for signalling
   (C) Needs no additional transmission facilities
   (D) Finds it difficult to handle signalling during speech

f.   In a day, the 60-minute interval in which the traffic is the highest is called the_____

   (A) Busy hour(BH)   **(B)** Peak BH
   (C) Time consistent busy hour   **(D)** None of these

g.   In a communication system what is the significance of S/N ratio being –3dB?

   (A) Signal power is half of noise power
   (B) Signal power is twice of noise power
   (C) Signal power is equal to noise power
   (D) None of these

h.   Direct inward dialling is used as a feature in _____

   (A) PSTN   **(B)** EPBX
   (C) PBX   **(D)** VPN

    i.   GOS is defined as _____
    (A) lost traffic - offered traffic
    (B) lost traffic + offered traffic
    (C) lost traffic/offered traffic
    (D) lost traffic*offered traffic

    j.   ISDN is leading the concept of _____
    (A) Intelligent network   **(B)** Broadband network
    (C) Standard network   **(D)** None of these

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

Q.2 a. What are the different ways of designing 100 line exchange using uniselector and two motion selectors? Show at least two variations. Which is the best option? **(8)**
    b. Explain and compare uniselector and two motion selector switching system. **(8)**

Q.3 a. A subscriber makes three phone calls of 3 minutes, 4 minutes and 2 minutes duration in a one hour period. Calculate the subscriber traffic in erlangs, CCS and CM. **(8)**
    b. Explain :
    (i) Calling rate   (ii) Holding time   **(2×4)**

Q4 a. Design a strictly non blocking network for 1000 incoming and 1000 outgoing trunks. Also calculate the total cross points. **(8)**
    b. What is Grade of service and blocking probability? What are delay systems in telecommunication networks? **(8)**

Q.5 a. 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 100 ns and the bus switching and transferring time is 100 ns per transfer. **(8)**
    b. Draw and explain time division space switching in detail. **(8)**

Q.6 a. Draw a centralized SPC organization and explain how it works under load sharing operation? **(8)**
    b. Draw the signal exchange diagram for a local call used to represent the sequence of events between the subscriber and exchanges. **(8)**

Q.7 a. Describe the architecture of SS7 common channel signalling network with the help of a neat diagram. **(8)**
    b. Explain Channel Associated mode, Channel Non-Associated mode and Quasi-Associated mode of common channel signalling networks. **(8)**

Q.8 a. Explain in detail topology used in LAN technology. **(10)**
    b. Draw Asynchronous Transfer Mode (ATM) header structure. **(6)**

Q.9 a. What do you mean by numbering and addressing? Draw the ISDN address structure and explain how the addressing works? **(8)**
    b. Explain the concept of Network management and the various services associated with network management. **(8)**