Code: AE17/AT17   **Subject: TELECOMMUNICATION SYSTEMS**

AMIETE – ET/IT (OLD SCHEME)

Time: 3 Hours | **OCTOBER 2012** | **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.   Packet switching is used for:

   (A) Credit card verification
   (B) The internet and the World Wide Web
   (C) Automated Teller Machine
   (D) All of the above

b.   The number of point to point links required in a fully connected network for 50 entities is

   (A) 1250   **(B)** 2500
   (C) 1225   **(D)** 50

c.   The _____is a circuit-switched network, while the _____is a packet-switched network.

   (A) Telephone, ATM   **(B)** Satellite, Telephone
   (C) SONET and FDDI   **(D)** FDDI and SONET

d.   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

e.   For two stage network the switching elements for M inlets with r blocks and N outlets with s blocks is given by

   (A) $(M+N)(r+s)$ **(B)** $Ms + Nr$
   (C) $Mr + Ns$ **(D)** $(M + N)rs$

AE17/AT17 / OCTOBER – 2012   1   **AMIETE - ET/IT (OLD SCHEME)**

f. Telex is a

   (A) Telephone Service between various subscribers
   (B) Tele printer Service between various subscribers
   (C) Television Service between various subscribers
   (D) Telegraph Service between various subscribers

g. SPC is used for

   (A) Carrying Exchange Control Functions
   (B) Carrying Subscriber Control Functions
   (C) Exchange Hardware
   (D) Signalling Purpose

h. Example of circuit switching and Stored & Forward switching are

   (A) Telephone and Post of Telegraph respectively
   (B) Video Signal Post and Telegraph respectively
   (C) Digital Signal Post and Telegraph respectively
   (D) None of the above

i. Distortion caused on telephone line by an adjacent one is called

   (A) Cross Fire   **(B)** Cross Talk
   (C) Inductive Disturbance   **(D)** None of these

j. Ideal value of Grade of service is

   (A) zero   **(B)** unity
   (C) infinite   **(D)** ten

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

Q.2 a. Describe Digital Subscriber Loop (DSL).   **(8)**

   b. Write down differences between in Single stage and Multistage networks. **(8)**

Q.3 a. What is time division switching? With the help of block diagram explain basic time division time switching method.   **(8)**

   b. Explain Time-space-time (TST) switching structure in detail.   **(8)**

Q.4 a. What is Grade of service and blocking probability? What are delay system telecommunication networks?   **(8)**

   b. A switching system serves 10,000 subscribers with a traffic intensity of 0.1 E per subscriber. If there is a sudden spurt in the traffic, increasing the average traffic by 50%, what is the effect on arrival rate?   **(8)**

Q.5 a. Describe basic types of pair-gain systems.   **(8)**

   b. What is BORSCHT? Discuss the limiting factor of subscriber loop design. **(8)**

Q.6 a. Explain the architecture of GSM.   **(8)**

   b. List out advantage of cellular mobile telephony over alternative solutions and brief out the working concept.   **(8)**

Q.7 a. Explain different elements of optical fiber transmission system.   **(8)**

   b. A voice channel in a PSTN is band limited with a nominated bandwidth of 3.1 kHz. What is maximum data rate that voice channel can support with its limited bandwidth for the case.
   (i)   Noiseless Channel having 8 discrete levels in the signal
   (ii) Noisy channel having S/N =30 dB   **(8)**

Q.8 a. What is difference between packet switching and circuit switching? List out advantages and disadvantages of these two.   **(8)**

   b. Write short notes on:-
   (i) ATM Networks
   (ii) LAN   **(8)**

Q.9 a. How do you classify SONET Networks?   **(8)**

   b. What do you mean by numbering and addressing? Draw the ISDN address structure and explain how the addressing works?   **(8)**