Code: AE17/AT17   **Subject: TELECOMMUNICATION SYS**
Time: 3 Hours   **Max. Marks:**

DECEMBER 2010

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 half an hour 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. To interconnect two homogeneous WANs, we need a_____.

   (A) Bridge   **(B)** Router
   (C) Repeater   **(D)** None of the above

b. To employ multi-access in GSM, users are given different_____.

   (A) Time slots   **(B)** Bandpass filters
   (C) Handsets   **(D)** None of the above

c. Usually security in a network is achieved by_____.

   (A) Layering   **(B)** Grade of service
   (C) Addressing   **(D)** Cryptography

d. One factor in the accuracy of a reconstructed PCM signal is the_____.

   (A) signal bandwidth
   (B) carrier frequency
   (C) number of bits used for quantization
   (D) baud rate

e. In 16-QAM, there are 16_____.

   (A) combinations of phase and amplitude
   (B) amplitudes
   (C) phases
   (D) bps

f. The physical connection between an end point and a switch or between two switches is_____.

   (A) transmission path   **(B)** virtual path
   (C) virtual circuit   **(D)** None of the above

g. In which type of switching do all the packets of a message follow the
    channels of a path?

    (A) Datagram packet switching.
    (B) Virtual switching packet switching.
    (C) Message switching.
    (D) None of the above.

h. PSTN stands for

    (A) Power Switched Telephone Network.
    (B) Private State Telephone Network.
    (C) Public Switched Telephone Network.
    (D) Public Switched Traffic Network.

i. Step Index fibres are_____.

    (A) single mode and multi-mode
    (B) can only be single mode
    (C) only multi-mode
    (D) None of the above.

j. Which of the following topology is least affected by addition/removal of a
    mode?

    (A) Ring   **(B)** Star
    (C) Bus   **(D)** none of these

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

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

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

Q.3 a. Explain the process of transmission using Time Division Multiplexing
         (TDM).   **(6)**

b. The minority carrier recombination life time for an LED is 5ns. The d.c.
    optical output power is 320W. Determine the 3dB optical and electrical
    bandwidth and the optical power output at 40 MHz.   **(10)**

Q.4 a. Differentiate between various categories of data networks with examples. **(6)**

b. Explain the architecture of CDMA.   **(10)**

AE17/AT17 / DEC. - 2010   **2**   **AMIETE – ET/IT (OLD SCHEME)**

Q.5   a. Is optic fiber a better transmission medium than a copper cable? Comment.

   b. State the importance of each layer in OSI reference model.   **(8)**

Q.6   a. What are the functions of the ATM adaptation layer? List the various ATM
   services.   **(10)**

   b. What are the different elements of a queuing system and how they are analysed?
                                                                                     (6)

Q.7   a. What is handoff? Describe the advantages and disadvantages of having a high
   co-channel reuse factor.   **(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.8   a. What is Packet Switching? Write the advantages and disadvantages of packet
   switching with respect to circuit switching.   **(8)**

   b. A subscriber makes three phone calls of three minutes, four minutes and two
   minutes duration in a one-hour period. Calculate the subscriber traffic in
   erlangs, CCS and CM.   **(6)**

   c. Define the term grade at service and BHCA.   **(2)**

Q.9   Write short notes on any **TWO** of the following:

   (i)   ISDN
   (ii)   Network level signalling
   (iii) Transmission impairment and types   **(8+8)**