ROLL NO. _____

Code: AE17/AT17 Subject: TELECOMMUNICATION SYS

AMIETE – ET/IT (OLD SCHEME)

Time: 3 Hours **JUNE 2012** **Max. Marks: 10**

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 control system of electronic switching systems are called as

(A) Crossbar Systems **(B)** Stored Program Control Systems.
(C) Gigantic Switching System **(D)** Combination Switching Systems

b. A fully connected network supports full duplex communication using unidirectional links. The total number of links in such a network with n nodes is

(A) $^{n}C_2$ **(B)** $2 \times {}^{n}C_2$
(C) n^2 **(D)** 2n

c. A file is downloaded to a home computer using a 256 kbps modem connected to an ISP. If the download completes in 3.5 minutes, estimate the maximum size of data downloaded.

(A) 53.76 MB **(B)** 52.5 MB
(C) 53.87 MB **(D)** 52.8 MB

d. A network that provides a constant bandwidth for the complete duration of a message transfer is a

(A) Cell Switched Network **(B)** Circuit Switched Network
(C) Packet Switched Network **(D)** None of these

e. Near-end crosstalk refers to) is:

(A) Coupling from a transmitter into a receiver at a common location.
(B) Unwanted coupling into a received signal from transmitter at a distant location.
(C) Interference caused by other cables routed close to the cable of interest.
(D) None of these.

f. In a 100 line network, how many switching elements are required for no blocking operation?

(A) 100 **(B)** 25
(C) 50 **(D)** 10

g. Determine the switch advantage ratio of three stage network with N inlets and N outlets for the N=32768.

(A) 32 **(B)**16
(C) 8 **(D)** 4.

h. DAMPS stands for r

(A) Digital advanced mobile phone service
(B) DMINS Automated Message Preparation System
(C) Desktop Automated Message Processing System
(D) Distributed Atmospheric Modelling Prediction System

i. CSMA stands for

(A) Common Signalling Multitone Access
(B) Central Station Mobile Applications
(C) Chart Security Maintenance Application
(D) Carrier Sense Multiple Access

j. A circuit switched connection involves 5 switching nodes. Each node takes 2 seconds and 0.2 second for establishing and releasing connections respectively. If the data transfer rate is 2400 bps, compute the data transfer time for a message that is 600 bytes long.

(A) 10 Seconds **(B)** 13 Seconds
(C) 8 Seconds. **(D)** 11 Seconds.

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

Q.2 a. A three stage space switched network supports 128 inlets and 128 outlets. It is proposed to use 16 first stage and third stage matrices. Find the number of switching elements in the network, if it is non-blocking. At peak periods, the occupancy rate of an inlet is 10%. If the number of switch elements required for non-blocking operation is reduced by factor of 3, find the blocking probability of the network? **(8)**

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

Q.3 a. Illustrate different ATM transport connection with their switching Characteristics. **(8)**

b. Describe basic types of pair-gain systems. **(8)**

Q.4 a. Over a period of 10 minute observation interval, 40 subscribers interval calls. Total duration of call is 4800 seconds. Calculate the load offered to the network by the subscribers and the average subscriber traffic. **(4)**

b. In a telephone system, there are 30 servers and 100 subscribers. On an average, there are 10 busy servers at any time. The probability of all the servers being busy is 0.3. Calculate the grade of service for Erlang traffic and Engest traffic. **(4)**

c. Illustrate local calls held systems. **(8)**

Q.5 a. List out advantage of cellular mobile telephony over alternative solutions and brief out the working concept. **(8)**

b. Draw ADSL network configuration diagram and describe ADSL DMT implementation in detail. **(8)**

Q.6 a. Illustrate and Compare GSM and CDMA technology. **(8)**

b. List out the parameters identified for characterising the quality of service. **(8)**

Q.7 a. List out design consideration of fiber optic system. **(8)**

b. Describe SONET in detail. **(8)**

Q.8 a. What is difference between packet switching and circuit switching? List out advantage and disadvantages of these two. **(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.9 Write Shorts Notes on:

(i) BORSCHT
(ii) WDM
(iii) WAN and LAN
(iv) ISDN Protocol Architecture. **(4×4)**