Code: AE71/AC67/AT67/AE119/AC119/AT119
Subject: DATA COMM. & COMPUTER NETWORKS

AMIETE – ET/CS/IT (Current & New Scheme)

Time: 3 Hours   **December 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. DWDM enables data transmission capacity in terms of_____
   (A) Gbps   **(B)** Tbps
   (C) Mbps   **(D)** Kbps

b. TELNET provides a
   (A) Electronic Mail Transport   **(B)** Remote Logon
   (C) Routing   **(D)** Both **(B)** and **(C)**

c. Suppose that the spectrum of a channel is between 3MHz and 4MHz and SNRdB=24 dB. Calculate maximum channel capacity.
   (A) 8Mbps   **(B)** 12Mbps
   (C) 240Mbps   **(D)** None of these

d. Find the period of the function $f(t) = (10 \cos t)^2$
   (A) 50 cos 2t   **(B)** 10 cos 2t
   (C) 100 cos 2t   **(D)** None of these

e. Scrambling technique is
   (A) Filling Sequence   **(B)** Filling Frames
   (C) Filling Unsupervisory Frames   **(D)** Information Frames

f. The time it takes a signal to propagate from one node to the next is
   (A) Transmission Time   **(B)** Node Delay
   (C) Propagation Delay   **(D)** All of these

g. A SAN is a network to handle
   (A) Storage Needs   **(B)** Interconnect Large Systems
   (C) Large Bulk Storage   **(D)** Both **(A)** and **(C)**

h. The IEEE 802.11g standard provides data rate
   (A) <11 Mbps   **(B)** >11 Mbps
   (C) >64 Mbps   **(D)** T>20 Mbps

i. The RFC 826 defines an
   (A) Border Gateway Protocol
   (B) Address Resolution Protocol
   (C) Distance Vector Protocol
   (D) Link State Protocol

j. The protocol used to Routers periodically check which multicast groups are of interest to which hosts is
   (A) Recursive Resolution   (B) IGMP
   (C) Iterative Resolution   (D) IP Sec

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

Q.2 a. Explain the four technology trends which are particularly notable to enable the provision of increasing traffic capacity and the support of a wide range of services. **(8)**

   b. Explain how TCP/IP protocols are configured for communication. **(8)**

Q.3 a. Explain the different categories of Noises in communication system. **(8)**

   b. Discuss some characteristics that distinguish optical fiber from twisted pair or coaxial cable. **(8)**

Q.4 a. Explain with waveforms different digital signal encoding schemes. **(8)**

   b. Consider a frame consisting of two characters of four bits each. Assume that the probability of bit error is 10^{-3} and that it is independent for each bit.

   (i) What is the probability that the received frame contains at least one error?

   (ii) Now add a parity bit to each character. What is the probability? **(8)**

Q.5 a. Draw and discuss the structure of the HDLC frame. **(8)**

   b. Compare synchronous TDM and statistical TDM. **(8)**

Q.6 a. Explain the working of circuit switching. What are the limitations of crossbar switch? **(8)**

   b. Explain how Fixed Routing Strategy works while dealing with the routing requirements of packet-switching networks. **(8)**

Q.7 a. List and briefly define the types of operation provided by the LLC protocol. **(8)**

   b. Explain IEEE 802.11 protocol architecture mentioning its important features. **(8)**

Q.8 a. Explain the different address formats available with IPv4 protocol. **(8)**

   b. Discuss the different issues that may be considered during the concept of addressing in communication architecture. **(8)**

Q.9 a. Explain the functions of IGMP message format fields. **(8)**

   b. Lists the limitations of the SMTP/822 scheme. **(8)**