ROLL NO. _____

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

AMIETE – ET/CS/IT

Time: 3 Hours **DECEMBER 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. If more than two nodes share a single physical link, such a link is said to be _____.

(A) Point-to-point **(B)** Multiple-access
(C) Limited-access **(D)** Node-to-link access

b. The process of determining symmetrically how to forward messages toward the destination node based on its address is called _____.

(A) Hosting **(B)** Switching
(C) Inter-connecting **(D)** Routing

c. If the source node wants to send a message to some subset of the other nodes, but not all of them, the situation is called _____.

(A) Unicast **(B)** Broadcast
(C) Multicast **(D)** Subcast

d. If the switch receives packets faster than it can send them for an extended period of time, then the switch will run out of buffer space and some packets will have to be dropped. The switch operating in this state is said to be _____.

(A) Congested **(B)** Digested
(C) Over-loaded **(D)** Loaded

ROLL NO. _____

e. To divide time into equal-sized quanta, and send data over the physical link in a round-robin fashion is

(A) Synchronous Time-Division Multiplexing (STDM)
(B) Frequency-Division Multiplexing (FDM)
(C) Statistical Multiplexing
(D) Round-Robin Multiplexing

f. On a 10-Mbps network, it takes _____ time to transmit each bit.

(A) 1µs **(B)** 10µs
(C) 0.01µs **(D)** 0.1µs

g. The signal to noise ratio required to put T1 carrier on 50 KHz line is

(A) 45dB **(B)** 93dB
(C) 56dB **(D)** 18dB

h. The time taken by a message to travel from one end of a network to the other is

(A) Latency **(B)** Bandwidth
(C) Throughput **(D)** Performance

i. Class C default subnet mask is

(A) 255.255.255.0 **(B)** 255.0.0.0
(C) 255.255.0.0 **(D)** 255.255.255.255

j. The generator polynomial of a CRC is $g(x)=X^3+X+1$, the transmitted code for data 101101 is

(A) 101101001 **(B)** 101101100
(C) 101101000 **(D)** 101101011

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

Q.2 a. With neat block diagram explain data communication model. **(6)**

b. Explain the functions performed by the following layers of OSI model **(6)**
(i) Data link layer
(ii) Network layer
(iii) Session layer

c. Compare LAN and WAN. **(4)**

ROLL NO. _____

Q.3 a. Define the following terms with refers to data communication **(5)**
(i) Crosstalk (ii) Data rate
(iii) Bandwidth (iv) Noise
(v) Error rate

b. Compare guided and un-guided transmission media. **(6)**

c. Assuming that a PSTN has a bandwidth of 3000 Hz and a typical S/N power ratio of 30db, determine the maximum theoretical (data) rate that can be achieved. **(5)**

Q.4 a. Represent the binary data 01001100011 in **(5)**
(i) NRZ-L (ii) NRZI
(iii) Bipolar –AMI (iv) Manchester
(v) Differential Manchester Encoding format

b. What are the factors to be considered while selecting digital encoding format? **(5)**

c. For the binary data 1101001 plot differ digital shift keying modulated wave form and explain the same. **(6)**

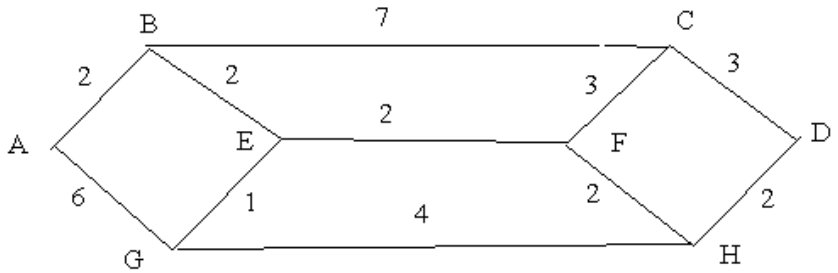
Q.5 a. What is the need of multiplexing? Explain different types of multiplexing used in computer networks. **(8)**

b. With neat diagram explain sliding window protocol. **(8)**

Q.6 a. What is congestion? Explain choke packet type of congestion control technique. **(5)**

b. Give the comparisons between circuit switching and datagram. **(5)**

c. Explain Dijkstra algorithm use Dijkstra algorithm to find the shorted path from A to D. **(6)**



Q.7 a. Mention the functions of a bridge. Give an illustration of two LAN's by a bridge. **(4)**

b. Explain the working of CSMA/CA and CSMA/CD protocol **(6)**

c. Draw the architecture of IEEE 802.11 and explain its working. Mention any four services of IEEE 802.11 **(3+3)**

Q.8 a. With neat diagram explain IPv4 header format. **(8)**

b. Compare IPv4 and IPv6 protocol. **(4)**

c. Mention the type of address for the following IP address **(4)**
(i) 126.33.44.56 (ii) 195.55.23.96
(iii) 132.133.134.136 (iv) 231.252.253.259

Q.9 a. Explain the working of User Datagram Protocol. **(5)**

b. Explain MIME transfer encodings. **(6)**

c. Define the uses of the following domains
(i) info (ii) museum
(iii) biz (iv) pro
(v) int **(5)**