Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech(CSE)/SEM-1/MCSE-105A/2012-13

2012

COMPUTER COMMUNICATION NETWORK

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any ten of the following : 10 × 1 = 10

   i) Which of the following transmission impairments adds unwanted signals to a transmitted signal ?

      a) Attenuation b) Delay Distortion

      c) Crosstalk d) Attenuation Distortion.

   ii) According to Nyquist's theorem, the maximum transmission rate (in bps) on a noiseless channel for a given bandwidth is

      a) Half bandwidth

      b) Equal to the highest signal frequency

      c) Twice highest signal frequency

      d) Twice the bandwidth.

iii) In the "Go-Back-N" ARQ mechanism, the maximum window size for a k-bit sequence number field in information frames is

a) k b) $k + 1$

c) 2^k d) $2^k - 1$.

iv) When installing an Ethernet 10BASE-T network type of cable is used ?

a) Fiber Optic b) Coaxial Cable

c) Twisted Pair d) Wireless.

v) Which LAN standard has the highest data rate ?

a) 10Base5

b) 10Base-T

c) Twisted Pair Token Ring

d) FDDI.

vi) Which of the following IP Network addresses is a reserved address ?

a) 127.0.0.0 b) 130.50.0.0

c) 197.65.10.0 d) 4.0.0.0

vii) IP addresses are converted to

a) A binary string

b) Alphanumeric string

c) A hierarchy of domain names

d) A hexa decimal string.

viii) Find the minimum bandwidth for an ASK signal transmitting at 2000 bps the transmission mode is half duplex.

a) 100 Hz b) 200 Hz

c) 1000 Hz d) 2000 Hz.

ix) The process-to-process delivering of the entire message is the responsibility of the ..... layer

a) Network b) Transport

c) Application d) Physical.

x) A noiseless channel with a bandwidth of 3000 Hz is transmitting a signal with two signal levels. What is the maximum bit rate ?

a) 2000 bps b) 3000 bps

c) 5000 bps d) 6000 bps.

xi) Which of the following is an application layer service

a) Remote login

b) File transfer and access

c) Mail service

d) All of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) What do you mean by Switching ?

b) What are the differences between Circuit Switching network and Packet Switching Network ? 2 + 3

3. What is the QAM ? What is the advantage of QAM over ASK and PSK ? 3 + 2

4. What is CRC ? How do you find CRC ?

5. In selective repeat ARQ, the site of the sender and receiver side will be at most one-half of 2^m, where m is the sequence number of the frame.

6. Describe the interleaving process in TDM ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is the major disadvantage in using NRZ encoding ? How does RZ encoding attempt to solve the problem ? 2 + 2

   b) Draw line encoding using Manchester encoding for a bit pattern 1010001011. 4

   c) A data bit sequence M = 1101110 is transmitted but the receiver receives the sequence with any one bit corrupted. Using hamming code to identify the corrupted bit position and correct the bit. 7

8. a) Describe stop and wait ARQ with diagram. What is Piggy backing networking ? 3 + 2

   b) Name the type of HDLC frames and give a brief description of each frame. 1 + 2 + 2 + 2

   c) In HDLC, what is the bit stuffing and why is it needed ? 3

9. a) What is transparent bridge ? What is looping problem in transparent bridge ? What is the procedure to solve the problem ? 3 + 2 + 3

   b) Discuss CSMA/CD multiple access strategy ? What is token passing ? 4 + 3

10. a) What do you mean by routing ? 2

    b) What are the differences between TCP and UDP ? 3

    c) What do you mean by Subnetting ? In a network, IP is 190.240.33.91 and number of subject is 13. What will be the subnet addresses ? 2 + 3

    d) What is supernetworking ? What do you mean by classless addressing ? 2 + 3

11. a) If a = propagation delay/transmission delay and P is the probability of frame error then prove that Channel utilization in the case of stop and wait ARQ protocol is (1– P) / (1 + 2a). Assume negligible sender, receiver processing time, transmission time and acknowledgement time. 5

b) Draw the simplified phase diagram from bringing up a line up and brining it down in PPP and explain various phases. 5

c) Ether technology is based on broadcast protocol. Explain. What happens when a collision occurs in Ethernet Communication. 3 + 2

12. Write short notes on any *three* of the following : 3 × 5

a) DHCP

b) NAT

c) Congestion Control

d) Transmission Impairments

e) FM.