Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CSE)/SEM-6/CS-601/2010

2010

COMPUTER NETWORKS

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 the following : $10 \times 1 = 10$

   i) If a signal changes instantaneously, its frequency is

   a) 0 b) finite

   c) infinite d) none of these.

   ii) A digital signal has eight levels. How many bits are needed per level ?

   a) 0 b) 4

   c) 3 d) none of these.

   iii) The value of SNR_{dB} for a noiseless channel is

   a) 0 b) finite

   c) infinite d) none of these.

   iv) Total bandwidth required for AM is

   a) 0 b) $2 (1 + d) B$

   c) $2B$ d) none of these.

v) In ..... we make the highest input data rate the dominant data rate and then add dummy bits to the input lines with lower rates.

a) multiplexing b) interleafing

c) pulse stuffing d) none of these.

vi) Circuit switching takes place at the ..... layer.

a) transport b) data link

c) physical d) none of these.

vii) The hamming distance $d(000, 011)$ is

a) 0 b) 1

c) 2 d) none of these.

viii) PPP is a ..... oriented protocol.

a) phase b) bit

c) byte d) none of these.

ix) The address space of IPv4 is

a) 0 b) infinite

c) 2^{32} d) none of these.

x) All objects managed by SNMP are given an object identifier. The object identifier always starts with

a) 0 b) 1.3.2.6.1.1

c) 1.3.6.1.2.1 d) none of these.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What are the different types of addresses contained in a packet flowing in the internet ? 2

b) Explain each one of them with respect to their usefulness. 3

3. a) In HDLC, what is bit staffing and why is it needed ?

b) What is the minimum window size required for selective repeat ARQ protocol and how ?

4. What are the disadvantages in using NRZ encoding ? How does RZ encoding attempt to solve the problem ?

5. What is the purpose of Guard bands ? In FDM, suppose there are three signal sources each having bandwidth 300 MHz. Find the minimum bandwidth of the path if 10 MHz guard bands are used.

6. Compare and contrast between OSI and TCP layered models.

GROUP – C

(Long Answer Type Questions)

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

7. a) How is CSMA a clear improvement over ALOHA ? How is it further improved by implementing CSMA / CD ? 4

   b) Explain the operation of CDMA technology. 5

   c) Differentiate between connected-oriented and connectionless services implemented by the network layer. 3

   d) Suppose in a CSMA/CD LAN, the maximum end to end propagation delay is 25.6 μ second.If the LAN is operating in 100 Mbps, then what will be the minimum frame length (in bytes) of the LAN ? 3

8. a) Differentiate between FHSS and DSSS spread spectrum.4

   b) Discuss the 802.11 protocol. Draw the lower two layers of the IEEE 802.11 protocol. What are the functions of DCF and PCF ? 7

   c) Distinguish between a router and a bridge. What do you mean by transparent bridge ? 4

9. a) Explain CRC code with an example. 8

   b) Explain link state routing. 5

   c) What is the difference between bit oriented and byte oriented protocols ? 2

10. a) Write brief notes on distance vector routing protocol. What is the primary difference between RIP and BGP ? What is the value of infinity in case of RIP ? 4

    b) Distinguish among the working principles of circuit switching, message switching and packet switching techniques. 3

    c) What do you mean by an Autonomous System (AS) ? What is the difference between Intra-AS and Inter-AS routings ? Give an example of each routing protocol. 3

    d) What do you mean by count-to-infinity problem ? How is the problem partially overcome by the technique Split Horizon with Poisson reverse method ? 5

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

    a) FDDI

    b) RIP

    c) Microwave transmission

    d) Wi-Max technology

    e) Distributed system

    f) CDMA

    g) QoS in Transport Layer.