2013
COMPUTER NETWORKS

Time : 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) The Hamming distance *d* (000, 011) is

a) 0 b) 1

c) 2 d) none of these.

ii) Which of the following is *not* IPv6 address ?

a) Any cast

b) Multicast

c) Broadcast

d) Unicast.

iii) Which of the following topologies is a point to point configuration ?

a) Mesh b) Star

c) Both (a) & (b) d) None of these.

iv) Which class of IP address is used for multicast communication ?

a) Class *A* b) Class *B*

c) Class *C* d) Class *D*.

v) The address space of IPv4 is

a) 0 b) infinite

c) 2^{32} d) 2^{128}.

vi) The maximum size of TCP header is

a) 64 byte b) 2^{16} byte

c) 32 byte d) 16 byte.

vii) 4-way handshaking of connection establishment is associated with

a) HTTP protocol b) UDT protocol

c) TCP protocol d) FTP protocol.

viii) 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.

ix) IEEE 802.5 standard is

a) Token Ring b) Token Bus

c) LLC d) FDDQ.

x) UDP is

a) connection-oriented b) connection-less

c) both (a) & (b) d) none of these.

xi) At which layer does circuit switching take place ?

a) Transport b) Data link

c) Physical d) None of these.

xii) Bridge function is

a) Transport layer b) Data link layer

c) Physical layer d) Both (a) & (b).

GROUP – B

(Short Answer Type Questions)

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

a) Define protocol.

b) Why multilayered reference model is preferred over single layered structure ?

c) Make a comparative study between circuit switching and packet switching. 1 + 2 + 2

3. Analyze the performance of Pure ALOHA. How does slotted ALOHA improve the performance over Pure ALOHA ? What are the basic differences between Pure ALOHA and Slotted ALOHA ? 2 + 2 + 1

4. a) What are the functions of data link layer ?

   b) How is single bit error detected by linear block code method ? 2 + 3

5. a) What are the disadvantages in using NRZ encoding ?

   b) How does RZ encoding attempt to solve the problem ? 2 + 3

6. a) What are the basic differences between Router and Gateway ?

   b) Explain Leaky bucket algorithm for congestion control. 2 + 3

GROUP – C

(Long Answer Type Questions)

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

A 10 bit data block 0111010111 is to send using Hamming code. Show how the receiver corrects an error that occurs in 6th bit position from right. 3

Explain the utility of layered network architecture. Compare ISO-OSI and TCP/IP models. 2 + 2

Sketch the following encoding scheme for the bit stream 10110010.

i) NRZ-I

ii) Manchester encoding

iii) Differential Manchester coding. 3

d) What is the difference between Go-back-N ARQ and Selective Repeat ARQ ? Explain CRC code with an example. 2 + 3

8. a) What are the advantages and disadvantages of using Distance Vector Algorithm ? 3

   b) Draw the IPv4 datagram header format and explain it. 5

   c) State the advantages of IPv6 over IPv4. 4

   d) Which class of IP address is used for multicast communication ? What is the purpose of supernetting ? 1 + 2

9. a) What is congestion ? Why does congestion occur ? Explain Token bucket algorithm. 1 + 1 + 4

   b) State the basic difference of TCP and UDP. 3

   c) Explain the SMTP and SNMP in brief. 3 + 3

10. a) What is the primary difference between RIP and OSPF ? 3

    b) What do you mean by unicast routing ? State the difference between static and dynamic routing. Give an example of each routing technique. 2 + 3 + 2

    c) What is DNS ? How is it implemented ? 2 + 3

Short notes on any *three* of the following : 3 × 5

CSMA/CA

ISDN

IEEE 802.11

Bluetooth

Cable MODEM.