Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech/(ECE-OLD)/SEM-6/EC-602/2013

2013

COMPUTER COMMUNICATION & NETWORKING

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 : $10 \times 1 = 10$

i) Vulnerable time for CSMA/CD protocol is

a) twice of average frame transmission time

b) twice of propagation time

c) propagation time

d) none of these.

ii) Advantage of layering includes

a) multi-vendor integration

b) data hiding nad encapsulation

c) easy testing

d) all of these.

iii) Multiple access of communication channel is defined by the

a) Data link layer b) Physical layer

c) Session layer d) Network layer.

iv) Switching in the network layer in the internet uses

a) Datagram approach to packet switching

b) Virtual circuit switching

c) Circuit switching

d) none of these.

v) Cat 5E cable supports data rates up to

a) 20 Mbps in digital analog mode

b) 100 Mbps in digital and analog mode

c) 125 Mbps in digital mode

d) 200 Mbps.

vi) In an environment with many high voltage devices, the best transmission medium would be

a) Twisted pair cable

b) Co-axial cable

c) Optical fibre

d) STP cable.

vii) In sonet Synchronous transport module (STM-3) raw data rate is

a) 51.84 Mbps b) 466.56 Mbps

c) 155.52 Mbps d) none of these.

viii) In CRC given polynomial is $x^7 + x^5 + x^2 + x + 1$, the divisor is

a) 10100111 b) 01011000

c) 11100011 d) 11000010.

ix) High level data link control (HDLC) is an actual protocol designed to support

a) both half duplex and full duplex communications over point to point link

b) full duplex communication over point to point link

c) none of these

d) simplex communication.

x) For stop and wait ARQ, n data frames are sent, ACK are needed

a) n b) $2n$

c) $n - 1$ d) $n + 1$.

xi) If an Ethernet destination address is 08-07-06-05-44-33 then this is a

a) Unicast address b) Multicast address

c) Broadcast address d) none of these.

xii) In classful addressing scheme class *B* addressing provides

a) 16384 blocks b) 2048 blocks

c) 8192 blocks d) 4096 blocks.

xiii) Four LANs (each using bus network) are connected through a 8 port hub

a) the network has 4 collision domains and 1 broadcast domain

b) the network has 1 collision domain and 1 broadcast domain

c) the network has 8 collision domains and 8 broadcast domains

d) none of these.

xiv) In a network the IP address of host is 205.16.37/28. The first address of the network is

a) 205.16.37.32 b) 205.16.37.0

c) 205.16.0.0 d) 205.34.35.0.

xv) A data-word consists of 5 bits. The no. of redundant bits required to make a code word is

a) 4 b) 5

c) 3 d) none of these.

GROUP – B
(Short Answer Type Questions)

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

2. What is the difference between classful and classless addressing schemes ? A router inside the organization receives the same packet with destination address 190.240.33.91. Show how it finds the sub-network address to route the packet. Assume that subnet musk is /19.

3. Why is flow control necessary in data communication ? Why are start bit and stop bit used in serial asynchronous communication ? 3 + 2

4. What is the basic difference between bridge and switch ? Why is hub called multi-port repeater ? 3 + 2

5. Given data unit is 1100111-1011001-1100101-0101101, how is 2 dimensional parity generated from the given data unit ? Why is data compression required when the real time data moves from one network to another network ? 3 + 2

6. What is the difference between physical address and logical address ? Explain with example. Using an example show how physical addresses are changed in hot to hop communication during the journey of packet ? 2 + 3

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. 3 × 15 = 45

7. a) Write down the different multiple access methods used in data communication.

   b) What is CSMA/CD ? Describe CSMA/CD with flow chart. Prove that vulnerable time for slotted aloha protocol is average frame transmission time. 2 + 8 + 5

8. What are the major drawbacks of X.25 protocol ? What are the advantages of ATM based network ? Describe IEEE 802.3 Ethernet Lan architecture. 3 + 4 + 8

9. Why is window size $2^m - 1$ in case of sliding window protocol ? Describe stop and wait ARQ lost frame operation. How does piggy backing save the bandwidth ? 5 + 6 + 4

10. What are unicast multicast addresses ? Describe IEEE 802.3 MAC frame architecture. Why is minimum frame size 64 byte for 10 base T-ethernet ? 2 + 8 + 5

11. What are the principles of security ? Why is symmetric key cryptography used for long messages ? How does symmetric key cryptography differ from public key crytography ? What is RSA ? How does the decryption procedure take place using RSA technique ? 2 + 2 + 3 + 1 + 7

12. What are the major advantages of layering model ? Describe TCP/IP model of networking. Give at least one example for each layer. 5 + 10

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

    a) V.90 modem

    b) Data encryption standard

    c) Internetworking using IP address

    d) Packet switching

    e) Transmission media.