Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH/CSE/NEW/SEM-6/CS-602/2013

2013

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 the dataword is 111111, the divisor is 1010, the remainder is 110, the CRC codeword is

   a) 1111111010 b) 111111110

   c) 1010110 d) 1101010.

   ii) In ..... ARQ, if a NAK is received, only the specified damaged or lost frame is transmitted.

   a) Go-Back-N b) Selective Repeat

   c) Stop-and-wait d) all of these.

   iii) ..... is a collision free technique.

   a) Token Passing b) CSMA

   c) ALOHA d) CSMA/CD.

   iv) Repeaters function in the ..... layer.

   a) Physical b) Data link

   c) Network d) Transport.

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v) HDLC protocols insert a 0 bit after ..... consecutive 1 bits in the message data.
a) 5 b) 7
c) 4 d) 8.

vi) Which channel access method is used in IEEE 802·5 network ?
a) CSMA/CD b) Token bus
c) Token ring d) All of these.

vii) Which class of IP address is reserved for multicast communication ?
a) Class *A* b) Class *B*
c) Class *C* d) Class *D*.

viii) For a 4-bit sliding window, sequence number range is
a) 1 to 16 b) 0 to 7
c) 0 to 15 d) 8 to 15.

ix) How much of channel output of slotted ALOHA will be in comparison to pure ALOHA ?
a) Same b) Double
c) Three times d) None of these.

x) Process to Process delivery is the function of ..... layer.
a) Transport b) Network
c) Physical d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. What is Bit Rate ? What is Baud Rate ? An analog signal carries 4 bits in each signal unit. If 1000 signal units are sent per second, find the Baud rate and Bit rate.

3. a) What is the purpose of subnetting ? Find the netid and the hostid of the following IP addresses

i) 19.34.21.5

ii) 220.34.8.9

b) A network is with subnet mask of 255.255.255.254. Determine maximum number of Hosts in the networks. What is the broadcast address of that network ?

4. a) Sketch the waveform for the bit stream 10110010 in differential Manchester encoding scheme.

b) Write the difference between bit stuffing and character stuffing. 2 + 3

5. What is intranet ? Why is coaxial cable superior to twisted pair cable ? Differentiate between IP address and MAC address. 1 + 2 + 2

6. a) Suppose a sender is using sliding window protocol of window size 15. What will be the window status for the following occurrence ? Sender has sent packets 0 to 11 and has received NAK 6.

b) "In Selective-Repeat ARQ, sender window size > 2^{m-1}." Is it correct ? Justify. 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Given a 10 bit sequence 1010011110 and a divisor 1011. Find the CRC. Check your answer.

b) Write down the similarities and differences between OSI and TCP/IP model.

c) What is piggybacking ? 7 + 5 + 3

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8. a) Discuss and differentiate between persistent CSMA and non-persistent CSMA.

   b) Prove that $2^r \geq m + r + 1$, where m is the no. of data bits and r is the no. of redundancy bits required to correct the error.

   c) How does a single bit error differ from a burst error ?

   5 + 5 + 5

9. a) State the advantage of IPV6 over IPV4.

   b) Explain link state routing.

   c) Differentiate between ARP and RARP. 5 + 5 + 5

10. a) What is a multiplexer ? Discuss one analog multiplexing technique.

    b) Describe the following encoding techniques with suitable diagrams :

       i) QPSK

       ii) QAM

       iii) FSK

    c) Discuss the advantages of fibre optic cable.

11. a) Find the expressions for average delay and throughput for both pure ALOHA and slotted ALOHA. Compare their performances as well.

    b) What do you understand by data privacy ? How can the authentication, integrity and non-repudiation be implemented by digital signature ?

    c) Differentiate between circuit switching and packet switching.

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