CS/BCA/SEM-5/BCA-501/2013-14

2013
DATA COMMUNICATION AND 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 × 1 = 10

    i)   Which topology requires a central controller or hub ?

         a)   Mush   b)   Star

         c)   Bus   d)   None of these.

    ii) FTP stands for

         a)   File Transfer Protocol   b)   File Tree Protocol

         c)   Field Transfer Protocol d)   None of these.

    iii) The end to end delivery of the entire message is the

         responsibility of

         a)   network layer   b)   transport layer

         c)   session layer   d)   presentation layer.

iv)   RZ stands for

    a)   Return to zero

    b)   Return to zero position

    c)   Return to zero multipolar

    d)   None of these.

v)   Which of the following can be determined from a frequency domain graph of a signal ?

    a)   Bandwidth   b)   Phase

    c)   Power   d)   None of these.

vi)   Power gain can be represented as

    a) $20 \log 2\ (P2/P1)$ b) $10 \log 2\ (P2/P1)$

    c) $\log 2\ (P2/P1)$ d)   none of these.

vii)   ASK, PSK, FSK are the examples of

    a)   Digital to digital   b)   Digital to analog

    c)   Analog to analog   d)   None of these.

viii)   Synchronous transmission does not have

    a)   a start bit   b)   a stop bit

    c)   gaps between bits   d)   none of these.

ix)   IEEE stands for

    a)   Institute of electrical and electronic engineers

    b)   Institute of electronics and electrical engineers

    c)   International electrical and electronic engineers association.

    d)   None of these.

x)   Most popular cable used in communication nowadays is

    a)   Coaxial cable   b)   Twisted pair cable

    c)   Fibre optic cable   d)   None of these.

GROUP – B

(Short Answer Type Questions)

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

2. a) How does graded index multimode optical fibre transmission minimize data loss ?   3

   b) What is Burst Error ?   2

3. Given a 10 bit sequence 1011001001 and a divisor of 1011, find the CRC.

4. a) What is the significance of twisting in a twisted pair cable ?   3

   b) What is Trellis coding ?   2

5. What are the advantages of IPv6 over IPv4 ?

6. What are the functions of Gateway and Repeater ?   2 + 3

GROUP – C

(Long Answer Type Questions)

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

7. a) Draw the digital signal encoding format for NRZI, NRZL, RZ Manchester Code and Differential codings for the digital signal 01001100011 and also write down the procedure in brief.   10

   b) In QPSK modulation data rate is 9600 bps. Calculate baud rate.   2

   c) An analog signal carries 4 bits in each signal element. If 1000 signal elements are sent per second, find baud rate and bit rate.   3

8. a) Why do we need use of layered protocol ?   5

   b) Give three differences between OSI reference model and TCP/IP model.   4

c) The bit pattern 01011001 is to be transmitted using the following techniques :

   i) ASK

   ii) FSK

   iii) PSK   6

9. a) Write down the names of different multiple access protocols. Compare FDMA, TDMA and CDMA.   3 + 5

   b) State Nyquist theorem.   2

   c) Write a short note on CSMA/CD.   5

10. a) Draw the block diagram of stop-and-wait ARQ protocol and explain it.   3 + 3

    b) Explain the Sliding window. What is Piggy backing ?

                                                                          6 + 3

11. a) What do you mean by congestion ? Why does congestion occur in the network layer ?   5

    b) Describe the concept of Leaky Bucket for controlling congestion.   6

    c) Explain the terms 'Bridging' and 'Routing'.   4

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

    a) Safe IP

    b) Public key and private key

    c) Circuit switched and packet switched networks

    d) 802·3 LAN

    e) X·25 protocol.