MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

BCA-501

DATA COMMUNICATION AND COMPUTER NETWORKS

Time Allotted: 3 Hours   Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP A
(Multiple Choice Type Questions)

1. Answer any *ten* questions.   10×1 = 10

    (i) A system uses 32 levels for data representation for transmission; the number of bits that this system can support is _____.

    (A) 4   (B) 16
    (C) 32   (D) 5

    (ii) Baud is _____

    (A) number of bits per second

    (B) number of signal changes per second

    (C) number of bytes per second

    (D) number of character per second

    (iii) ARP is used to find _____

    (A) IP address   (B) MAC address
    (C) Subnet address   (D) Host address

5142   1   **Turn Over**

(iv) How many redundancy bits are required to correct a data containing 8 bits?

(A) 3   (B) 4

(C) 5   (D) 8

(v) Firewall _____

(A) allows people on the internet to see just one IP address

(B) does not allow any connections to server

(C) restricts unauthorized users from accessing sensitive data

(D) manages password function

(vi) In which ARQ, when a NAK is received, all frames sent since the last frame acknowledge are retransmitted?

(A) Stop-and-Wait   (B) Go back n

(C) Selective Reject   (D) Both (A) and (B)

(vii) The highest data rate is provided by the transmission medium _____

(A) Coaxial Cable   (B) Twisted Pair

(C) Optical fiber   (D) Microwave

(viii) What is present in all HDLC control fields?

(A) P/F bit   (B) N(R)

(C) Code bits   (D) N(S)

(ix) Signal become weak with increase in distance traveled because of

(A) modulation   (B) attenuation

(C) distortion   (D) switching

(x) IP address in the B class is given by

(A) 125.123.123.3   (B) 191.023.21.52

(C) 192.128.32.56   (D) 10.17.16.38

(xi) Usually information security is achieved by

(A) layering   (B) addressing

(C) grade of service   (D) cryptography

(xii) Router operates in _____

(A) data link layer   (B) network layer

(C) transport layer   (D) all of these

GROUP B
(Short Answer Type Questions)

Answer any *three* questions.   3×5 = 15

2. What is transmission impairment? What are its causes?   5

3. Distinguish between Circuit switching and Packet switching.   5

4. Define bit rate and baud rate. Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels. Calculate the maximum bit rate.   3+2

5. (a) What is Ethernet?   1
    (b) What are the differences between IEEE 802.4 and IEEE 802.5?   4

6. (a) What do you mean by multiplexing?   2
    (b) Discuss the basic difference between TDM and FDM.   3

GROUP C
(Long Answer Type Questions)

Answer any *three* questions.   3×15 = 45

7. (a) Communications services may be classified as Connection Oriented or Connectionless. Briefly summarize the principal difference between these two service classes.   6

    (b) Write down the advantages and disadvantages of Synchronous and Asynchronous modes of data transmission.   6

    (c) Given a bandwidth of 6000 Hz for an 8-PSK signal, what are the baud rate and bit rate?   3

8. (a) Explain the operation of CRC error detection method. By means of an example show how:
   (i) The error detection bits are generated
   (ii) The received frame is checked for transmission errors
   Use the generator polynomial $x^3 + x + 1$.   8

   (b) In stop-and-wait flow control, define and discuss the handling of   7
   (i) A damaged frame
   (ii) A lost frame

9. (a) Differentiate between Link State and Distance Vector routing algorithms.   5

   (b) What do you mean by encryption and decryption? What is Cipher text?   6
   Explain different encryption techniques under conventional method of
   encryption and decryption.

   (c) What is inverse multiplexing? Why do we need inverse multiplexing?   4

10.(a) Explain the IEEE 802.3 MAC frame format.   6

   (b) Explain X.25 frame format. How packets are associated with the virtual   7
   circuit on which they travel? What is the purpose of an LCN?

   (c) A file contains 3 million bytes. How long does it take to download this file   2
   using a 100-Kbps channel and 10-Mbps channel?

11.   Write short notes on any *three* of the following: 3×5
   (a) Firewall
   (b) Describe the following terms.
       (i) Hop-by-hop
       (ii) End-to-end
   (c) UDP
   (d) TELNET
   (e) IP6