MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : BCA-501

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 any *ten* of the following : $10 \times 1 = 10$

   i) Routing and switching in a frame relay is performed by

      a) Physical Layer

      b) Data Link Layer

      c) Network Layer

      d) Data Link Layer and Network layer.

ii) Shannon Capacity determines

a) noise present in the channel

b) highest data rate in a noisy channel

c) channel is noiseless

d) all of these.

iii) HDLC is a ..... protocol.

a) bit oriented

b) character oriented

c) transport layer

d) none of these.

iv) IPv4 Address is

a) 8 bit b) 16 bit

c) 32 bit d) 64 bit.

v) In digital transmission

a) bit rate is higher than baud rate

b) bit rate is lesser than baud rate

c) none of these.

vi) BSC protocol uses

a) simplex b) full duplex

c) half duplex d) none of these.

vii) A network that provides a constant bandwidth for the complete duration of a message transfer is a

a) circuit switched network

b) call switched network

c) packet switched network

d) none of these.

viii) The number of outgoing lines in a hub is

a) 1 b) n

c) n + 1 d) n – 1.

ix) What is the network address for 198.76.9.23 ?

a) 198.0.0.0 b) 198.76.0.0

c) 198.76.9.0 d) none of these.

x) Microwave link repeaters are typically 50 km apart because of

a) cost

b) atmospheric attenuation

c) Earth's curvature

d) output power limitations.

xi) In sliding window protocol if the window size is 64, what is the range of number ?

a) 0 to 63

b) 0 to 64

c) 1 to 63

d) None of these.

GROUP – B

(Short Answer Type Questions)

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

2. Briefly explain Leaky Bucket Algorithm.

3. Briefly explain IPv6 datagram.

4. a) Find the maximum bit rates for an FSK signal if the bandwidth of the medium is 12000 Hz and the difference between the two carriers must be at least 2000 Hz. (Transmission is in duplex mode)

   b) What are the functions of DTE ? Give example. 3 + 2

5. Explain Delta Modulation with proper example and mention its limitations.

6. State Nyquist theorem. What is the Nyquist sampling rate ? What is the effect of aliasing ? 3 + 2

GROUP – C

(Long Answer Type Questions)

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

7. a) Compare between Asynchronous TDM and Synchronous TDM with proper diagram.

   b) Explain Packet Switching Network and Circuit Switching Network.

   c) What is MAC address ?

   d) Briefly explain Token Bucket Algorithm of Congestion Control. 6 + 4 + 1 + 4

8. a) Compare OSI and TCP reference model with diagram.

   b) Describe the functions of router and bridge with suitable diagram.

   c) What do you mean by piggy backing ? 7 + 5 + 3

9. a) What is network topology ? Write the advantages of ring topology over star topology.

   b) Describe the structure of HDLC frame in detail.

   c) Write the functions of preamble field of 802.3 frame. Describe the priority scheme to Token Ring LAN. (2 + 3) + 5 + (2 + 3)

10. a) What are the needs of modulation ?

    b) Compare among ASK, FSK and PSK with the help of the sketch.

    c) For 1001101101, draw the line codes in PRZ, BPRZ and Manchester Code. 6 + 6 + 3

11. Write short notes on any *three* of the following : $3 \times 5 = 15$

a) X.25 protocol

b) 802.X

c) Network Socket

d) Symmetric key cryptography

e) SSL Tunnel.