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**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 the following : $10 \times 1 = 10$

   i) OSI stands for

   a) open system interface

   b) open system interconnection

   c) organizational system interfaces

   d) none of these.

ii) Which topology requires a multipoint connection ?

a) Mesh b) Star

c) Bus d) Ring.

iii) The main function of Transport layer is

a) node to node delivery

b) process to process delivery

c) synchronization

d) updating & maintenance of routing tables.

iv) If the baud rate is 400 for a 4-PSK signal, the bi rate is

a) 100 bps b) 400 bps

c) 800 bps d) 1600 bps.

v) Baud means

a) the no. of bits transmitted per unit time

b) the no. of bytes transmitted per unit time

c) the rate at which signal changes

d) none of these.

vi) UDP belongs to

a) Network layer

b) Transport layer

c) Mac layer

d) Data link layer.

vii) Start and stop bits are used in serial communication for

a) error detection

b) error correction

c) synchronization

d) slowing down the communication.

viii) TCP is a/an

a) reliable connection oriented

b) unreliable connection oriented

c) reliable connectionless

d) unreliable connectionless.

ix) Repeater operates in

a) physical layer

b) data link layer

c) network layer

d) transport layer.

x) In a Go-Back-N ARQ, if the window size is 63, wh
is the range of sequence number ?

a) 0 – 63 b) 0 – 64

c) 1 – 63 d) 1 – 64.

## GROUP – B

### ( Short Answer Type Questions )

Answer any *three* of the following. 3 × 5 = 1

2. Briefly explain IPV4 Datagram with diagram.

3. What do you mean by CRC ? Explain with a bloc
diagram. 2 +

4. Explain the HDLC frame format.

5. Distinguish between open loop and closed loop congestion control.

6. Compare AM, FM and PM with example.

## GROUP – C

### ( Long Answer Type Questions )

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

7. Define ISDN. Explain the signaling system 7 ( SS7 ). Five channels each with a 100 KHz bandwidth to be multiplexed together. What is the minimum bandwidth of the link ? $2 + 5 + 5 + 3$

8. a) What is the differences between baud rate and bit rate ? 3

   b) Why is star topology not suitable for a large network ? 3

   c) Why is FSK not suitable for high speed modems ? 4

   d) What are the advantages of IPV6 over IPV4 ? 5

9. a) Using differential Manchester and NRZ-L line encoding techniques encode the following binary strings : 11000010, 01011011 5

b) What do you mean by asynchronous serial transmission ? 3

c) We have a channel with a 1 MHz bandwidth. The signal to noise ratio for this channel is 63. What is the appropriate bit rate and signal level ? 4

d) What is bit stuffing in HDLC ? 3

10. a) A signal is quantized using 10-bit PCM. Find the SNR in dB. 3

b) Find the maximum bit rate for an FSK signal if the bandwidth of the medium is 12000 Hz and the different between the two carriers must be at 2000 Hz. 4

c) A system is designed to sample analog signals, convert them to digital form with a 4-bit converter and transmit them. What bit rate is required if the analog signal consists of frequencies between 400 Hz and 3400 Hz. 4

d) Given the bit pattern 01100, encode this data using ASK and FSK. 4

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 & Routing'. 4