INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, LUCKNOW

MIDSEM SUBJECTIVE EXAM

COMPUTER NETWORKS (CNE4301C)
B.Tech 4th Sem – IT/ CS

Karan Agarwal
LIT2023011

Course Instructor: Dr.Deepshikha Agarwal

Time duration: 2 hours

Max.Marks: 30

- *Attempt any 05 questions. All questions carry equal marks*

Q1) (i) Draw the OSI Ref model with complete labeling at both the sender and receiver pair.
   (ii) Compare between the OSI Ref. model and TCP/IP Ref. model

Q2) (i) Elaborate the advantages and disadvantages of Character count framing method
   (ii) Show the framing (Flag Bytes with Byte stuffing) for the given data (FLAG:01111110,
      ESC: 11100000, A:01111001, B: 11111010, 1:00000001, 4:00000100, 6:00000110) -
      1 4 ESC 6 6 A B ESC ESC B A
   (iii) Find the original data without bit-stuff framing if the received frame is-
      01111110011111010101111001001111001000000001110000001111001111101010101110000001111101001111110

Q3) (i) Can LRC method detect all burst errors? Show with suitable examples.
   (ii) Generate the CRC code for the Message : 1010001101 if the divisor polynomial is
      $(x^5 + x^4 + x^2 + 1)$

Q4) (i) Compare between Non-persistent and 1-persistent CSMA protocols.
(ii) Suppose the Chipping sequence for 04 stations are c1: [+1 +1 +1 +1], c2: [+1 -1 +1 -1], c3: [+1 +1 -1 -1] and c4:[+1 -1 -1 +1]. Stations 1 wants to transmit bit '0', stations 2 transmits but '0' and station 3 transmits bit '1'. Station4 is listening to stations 1 and station 3.
Show the entire process of CDMA medium access control technique for the above example.

Q5) (i) In the Ethernet LAN technology, does Random backoff timer helps in reducing the collisions between data packets? Support your answer with suitable examples
(ii) An organization requires to connect 120 stations to form an Ethernet LAN. They are provided with 05 segments of Twisted pair cables and 04 repeaters. Show the connection diagram. What will be the specifications of this network in terms of data rates and length of the cable.

Q6) (i) How does the stations in a Token Ring network detect that a monitor station is dead?
(ii) How does the Token ring network ensure reliable delivery of packets without using Acknowledgements?
(iii) Suppose the data bits to be transmitted are 1001010001. Draw the Manchester encoding and Differential Manchester encoding for the data