JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- APRIL-2023

COURSE CODE(CREDITS): 18B11EC611(3) MAX. MARKS: 25
COURSE NAME: WIRELESS AND DATA COMMUNICATION
COURSE INSTRUCTORS: Er. Munish Sood MAX. TIME: 1 Hour 30 Minutes

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1) What are headers and trailers, and how do they get added and removed? What are the responsibilities of the data link layer in the Internet model? What are the responsibilities of the transport layer in the Internet model? What is the difference between a port address, a logical address, and a physical address? **CO-3(5)**

Q2) We need a three-stage space-division switch with N =100. We use 10 crossbars at the first and third stages and 4 crossbars at the middle stage. **CO-3(5)**

a. Draw the configuration diagram.
b. Calculate the total number of cross-points.
c. Find the possible number of simultaneous connections.
d. Find the possible number of simultaneous connections if we use one single crossbar (100 x 100).
e. Find the blocking factor, the ratio of the number of connections in c and in d.

Q3) Given the data-word 1010011110 and the divisor 10111.Using cyclic redundancy check
a. Show the generation of the codeword at the sender site (using binary division).
h. Show the checking of the codeword at the receiver site (assume no error). **CO-4(5)**

Q4) **a)** Compare and contrast the Go-Back-NARQ Protocol with Selective-Repeat ARQ.

b) Byte-stuff the data in following figure. **CO-4(5)**

ESC			FLAG			ESC	ESC	ESC		FLAG	

c) Bit-stuff the following data.
1000111111100111110100011111111111000011111

Q5) In the following figure, the data rate is 10 Mbps, the distance between station A and C is 2000 m, and the propagation speed is 2 x 10^8 *m/s*. Station A starts sending a long frame at time t_1 = 0 μ sec; station C starts sending a long frame at time t_2 = 3μ sec. The size of the frame is long enough to guarantee the detection of collision by both stations. Find:

a. The time when station C hears the collision *(t3)'*
b. The time when station A hears the collision *(t4)'*
c. The number of bits station A has sent before detecting the collision.
d. The number of bits station C has sent before detecting the collision. **CO-4(5)**