



EAST WEST UNIVERSITY

Department of Computer Science and Engineering B.Sc. in Computer Science and Engineering Program Mid Term I Examination, Fall 2021 Semester

Course: CSE 405 Computer Networks, Sec 3
Instructor: Dr. Anisur Rahman, Associate Professor, CSE Department
Full Marks: 30
Time: (50 min + 10 min) = 1 Hour

Note: There are FIVE questions, answer ALL of them. Course Outcome (CO), Cognitive Level and Mark of each question are mentioned at the right margin.

1. The following character encoding is used in a data link protocol: [CO1,C3, Mark: 6]

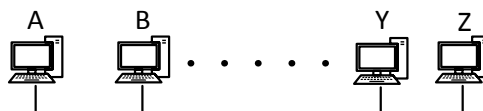
B: 01000011; D: 11111000; Flag: 01111110; Esc: 10001111

Identify the bit sequence transmitted in binary for the following six-character data when 'bit stuffing' framing method is used. Please indicate the stuffed bits.

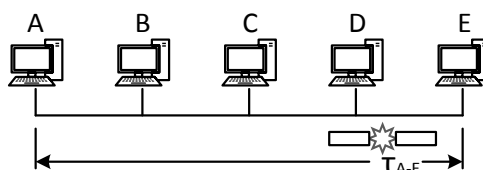
B **Esc** **Esc** **Flag** **Flag** **D**

2. How nodes determine the boundary of a frame in Physical layer coding violation method? If a bit sequence 100101011 is transmitted following physical layer coding violation; analyze how receiver would determine consecutive 0s or 1s. [CO1,C3, Mark: 6]

3. A bit map protocol is followed by the following nodes. The propagation delay between the farthest two nodes is 9μsec, calculate the minimum duration of the polling phase if there are 26 nodes present in the following LAN segment. If the part of the bit map is 10011.....101011, how would node E determine its turn to transmit. [CO1,C2, Mark: 6]



4. Describe briefly the waiting convention of Binary Exponential Backoff (BEB) algorithm. **Illustrate** how and when two hosts 'A' and 'B' get into collision consecutively if sets to pick elements for the hosts are $set = \{0,1,2,3\}$ and $set = \{0,1,2,3,4,5,6,7\}$ respectively. What would be nodes A and B's sets to pick elements from if 'E' also gets into collision for the first time with them? [CO1,C3, Mark: 6]



5. Determine the complete Petri net model for the following situation (mutual exclusion) where two processes P_1 and P_2 are going to use critical resources C_1 and C_2 . Please note that critical resources can be used by one process at a time and having multiple tokens in any state is a violation.

[CO1,C3,
Mark: 6]

