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**
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.

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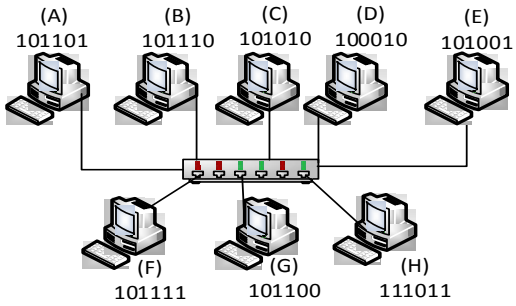
1. The following character encoding is used in a data link protocol: [CO1,C3, Mark: 6]

A: 01000011; B: 11100011; Flag: 01111110; Esc: 10001111

Formulate the bit sequence transmitted (in binary) i.e., the frame for the following six-character frame when "Bit stuffing" framing method is used. Please indicate the stuffed bits.

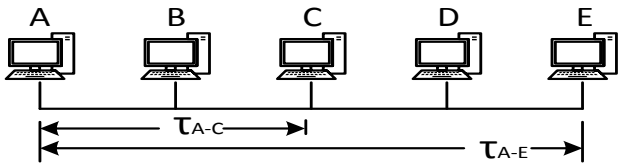
A	Esc	Esc	B	Flag	B

2. **Solve** which of the following numbered stations will acquire the channel at first if A, B, C, D and G are interested to acquire channel by following "Binary countdown" protocol? Please show the procedure of the countdown mechanism. [CO1,C3, Mark: 6]



3. **Illustrate** how and when two hosts A and B get into collision consecutively if sets to pick elements for the aforesaid hosts are *setA={0,1,2,3}* and *setB={0,1,2,3,4,5,6}* respectively. Analyze why it is not possible for A to communicate with B whatever the element A picked randomly from its own set. [CO1,C2, Mark: 6]

4. **Find** and **analyze** the contention period for the node A if node C is to be considered the destination in the following LAN. Assume the LAN uses CSMA/CD protocol for channel allocation purposes; and the propagation delay τ_{A-E} is bigger than τ_{A-C}. [CO1,C3, Mark: 6]



5. **Find** only the problems exist in the following Petri net model and **provide** the solution for mutual exclusion between three processes $\mathbf{P_1}$, $\mathbf{P_2}$ and $\mathbf{P_3}$ on the critical resource $\mathbf{C_1}$. [CO1,C3, Mark: 6]