Date:
25/3/2022 CS211 (Theory of Computation I)

DUE: April 3rd **HOMEWORK II (CO1)**

1- **Submit your solution as a single PDF file using Moodle.**
2- **Organization and Presentation worth 20% of the mark.**

Q1. Design a DFA for L = { w ∈ {a, b, c}*: w contains **abbc** as a substring}.

Q2. Design a DFA for L = { w ∈ {a, b, c}*: w does not contain **abbc** as a substring}.

Q3. Design a DFA for L = { w ∈ {a, b, c}*: w contains both **aa** and **bb** as substrings}.

Q4. Design a DFA for L = { w ∈ {0,1 }* : w contains an odd number of 0's and number of 1's is divisible by 3 }.

Q5. Convert the following NFA to DFA:

M = (Q, Σ, q0, δ, F), δ(q0, a) = {q1, q2}, δ(q1, λ) = {q3}, δ(q3, a) = {q2,q3}, δ(q2, b) = {q4}, δ(q3, b) = {q5}, δ(q4, λ) = {q5}, δ(q4, a) = {q4}, δ(q5, a) = {q5}, F = {q3, q5}

Q6. Minimize the following DFA using the marking algorithm as given in class:

M = (Q, Σ, q0, δ, F), δ(q0, a) = q1, δ(q0, b) = q3, δ(q1, a) = q2, δ(q1, b) = q4 , δ(q2, a) = q5, , δ(q2, b) = q4, δ(q3, b) = q2, δ(q3, a) = q4, δ(q4, a) = q5, δ(q4, b) = q2, δ(q5, a) = δ(q5, b) = q5. F = {q0, q5}