COMSATS University Islamabad, Attock Campus
Department of Computer Science

Program : BCS 5 (A + B)

FALL 2022 Mid Term Examination
Course: - Automata Theory

Time Allowed:- 1.5 Hrs
Dated:- 14/11/2022
Name:- MUAAZ SHOAIB **Reg. No.:-** FA20-BCS-074 **Marks:- 25**

Note:-Don't write anything on Question Paper except your name & Reg. No.

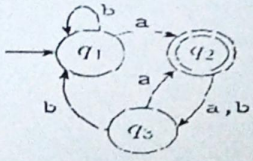
All students are required to undertake the "Honor Pledge" and beware that they would be held accountable in the court of Allah for their deeds and misconducts "In the name of Allah the most beneficent and merciful, I affirm that I will not give or receive any unauthorized help on this exam, and that all work will be my own."

Question: [CLO 2 (SO (2,3,4))]

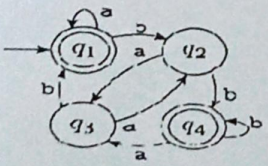
a. Consider the following languages defined over $\sum = \{a, b\}$. Build the DFA's for these languages.
Hint: Use complement method to avoid mistakes.

1. $\{w \mid w$ is any string not in $(a^+b)^+\}$
(03)
2. $\{w \mid w$ contains neither the substrings **ab nor ba**$\}$
(03)

b. Consider the following 2 DFA's



M_1



M_2

1. Perform State Elimination Method on M_2 to find RE. Elimination Sequence is (q2 q1, q3, q4)
(10)
2. Perform $M_1 \cap M_2$ and build the resultant **DFA.**
(06)
3. Build State Transition Table for M_2
(03)

********** Good Luck **********