University of Central Punjab

Mid Term Exam (Summer 2024)

Department of Computer Sciences

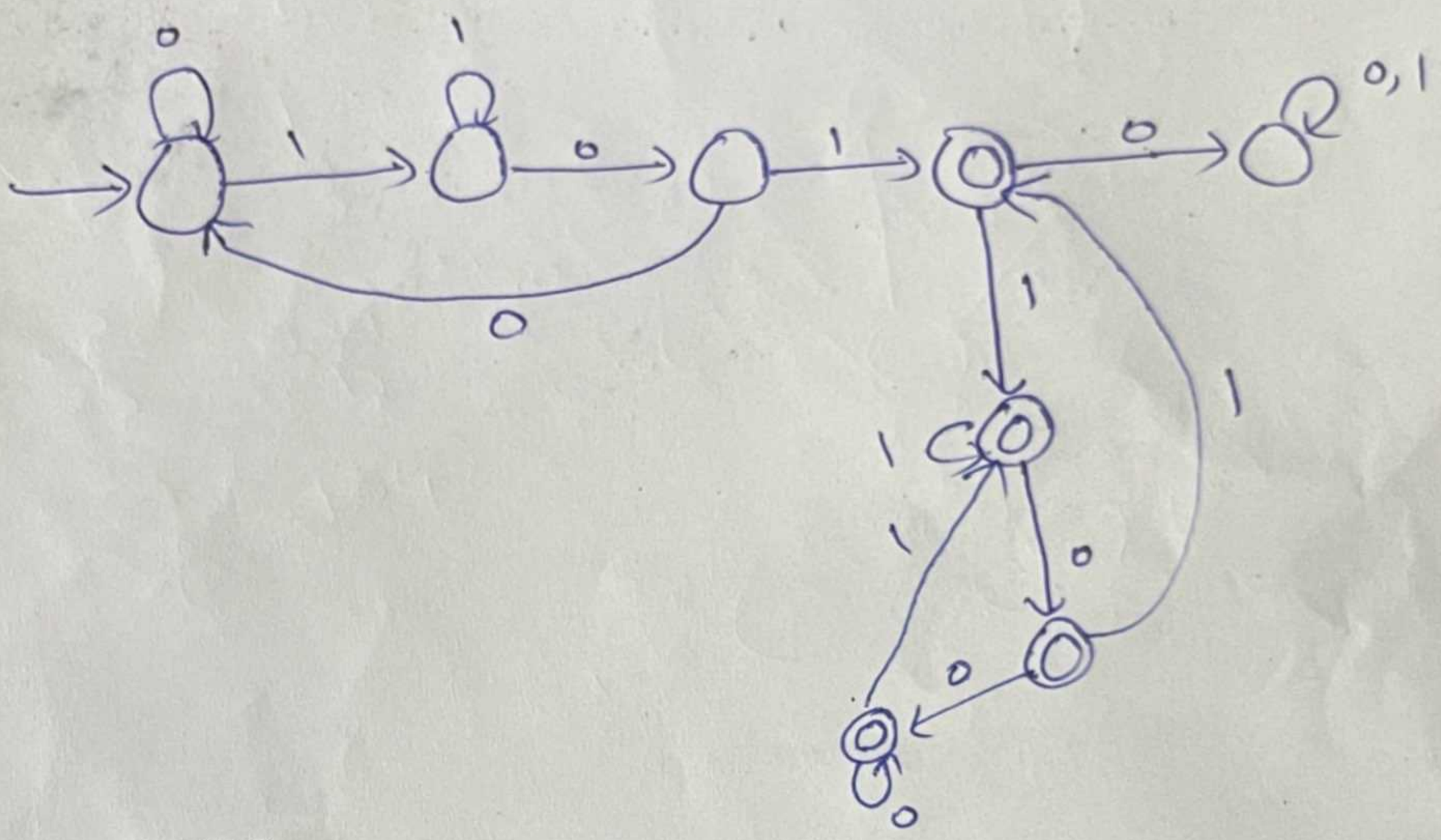
Program/Semester: BSCS/6th | **Course Code: CSAL- 3253**
Course Title: TOA | **Registration No: ----------**
Time Allowed: 90 Minutes | **Max Marks: 40**

Q1: (3+7)

Write first 6 strings in increasing order of the following language and design a Deterministic Finite Automata (DFA):

{w | w over ∑={0,1}, w contains 101 but does not contain the 1010}

A = { 101, 1011, 0101, 1101, 10111, 10110, --- }



Q2: (5+5)

Write down the Regular Expression for the following Languages;

a- ∑ = {a,b} L= {x | x ∈ ∑* The language of all strings in which every a (if there are any) is followed immediately by bb.}

$b^*(abb^+)^*$ = $(abbb^+ b^*)^k$

b- All strings over ∑={a, b} that contain the substring abb but not the substring aa.

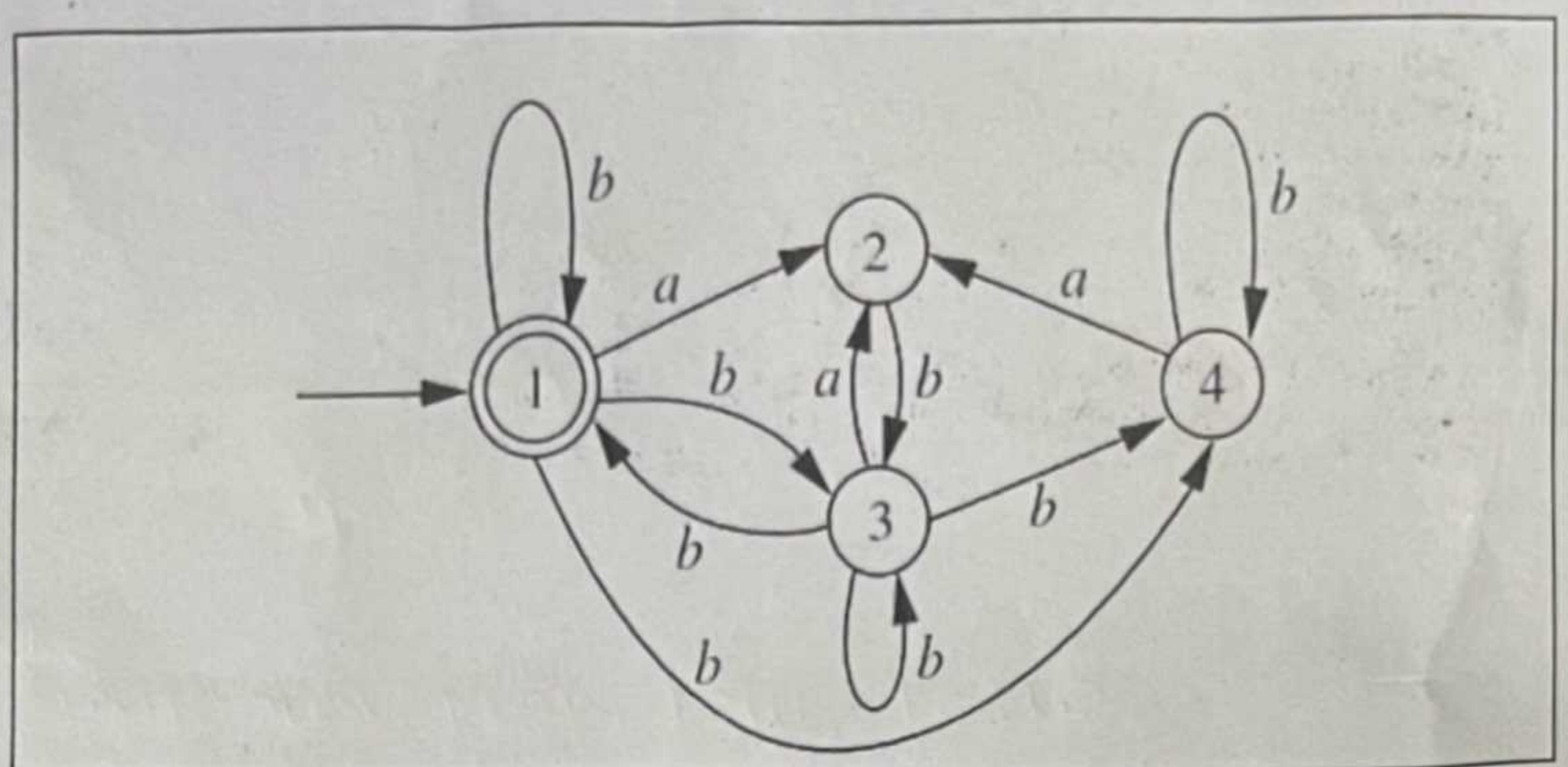
$(ab+b^*)^* abb (ab+b)^R (\wedge + a)$

bbababb

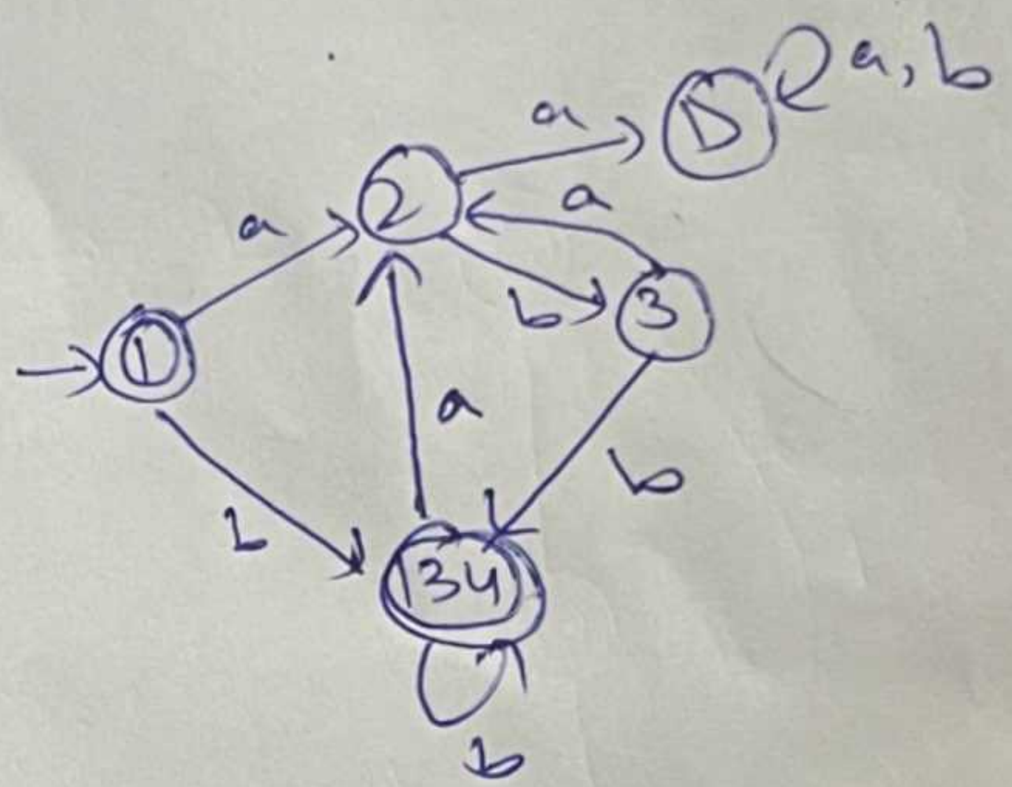
abba

Q3: (10)

Convert the following NFA into DFA.



	a	b
→1	2	134
2	D	3
*134	2	134
D	D	D
3	2	134



Q4: (3+7)

Write first 6 strings and construct an NFA **(NOT DFA)** for the following language:

{w | w over ∑={a,b}, w start with 'ab' and ends with 'ba' and does not end with ab.}

A = {aba, abba, abbba, ababa, abbbba, ababa
3 4 5 6