G. H. RAISONI COLLEGE OF ENGINEERING

2020-2021 EVEN TERM

CAE-1 EXAMINATION SUMMER-2021 (ONLINE MODE)

DEPARTMENT: ARTIFICIAL INTELLIGENCE
SEMESTER/SECTION: 4th / A
DATE OF EXAMINATION: 11/02/2021
SUBJECT: THEORY OF COMPUTATION
ROLL NO: A-58
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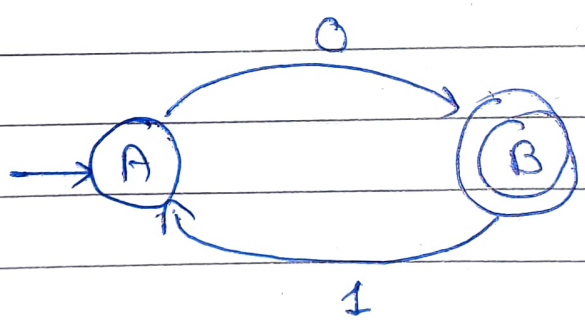
REGISTRATION NUM.: 2019AAIE1117028

CO2.

a.



Step 1: Eqn. for each state

$A = \varepsilon + B.1$ ——— (1)

$B = A.0$ ——— (2)

Step 2:
Bringing in form of $R = Q + RP$

Using (1) in (2), we get:

$$B = (\varepsilon + B.1).0$$
$$B = \varepsilon.0 + B.1.0$$
$$B = 0 + B.(1.0) \quad \text{——— (3)}$$

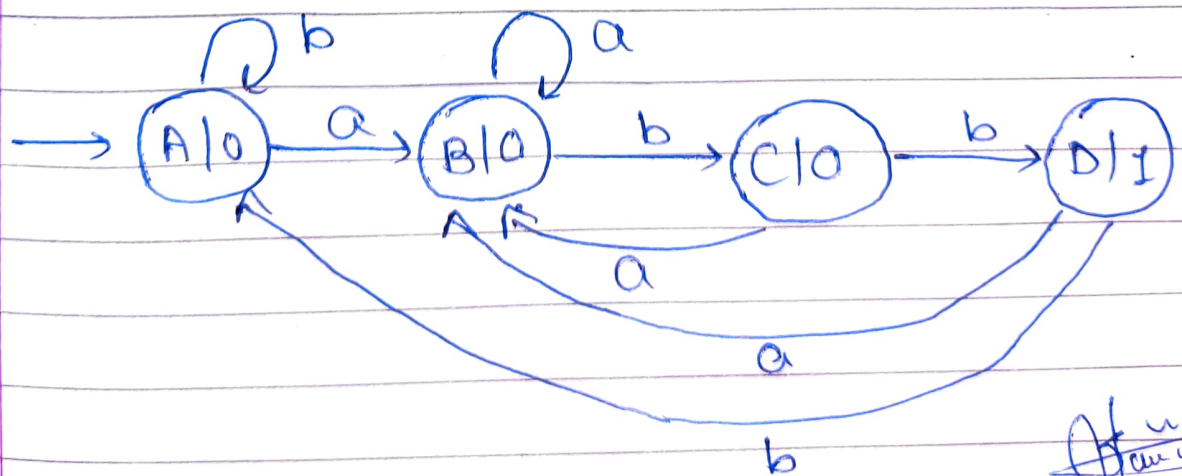
Using Arden's Theorem in (3),

$$B = 0.(1.0)^*$$

Thus, Regular Expression for the given DFA = $0(10)^*$

CO.2.
b.

$\Sigma = \{a, b\}$ $\Delta = \{0, 1\}$



To check:

a	b	b
Ⓑ	Ⓒ	Ⓓ
0	0	1

Sequence: Ⓐ

Sequence:

a	b	b	a	b	b
Ⓑ	Ⓒ	Ⓓ	Ⓑ	Ⓒ	Ⓓ
0	0	1	0	0	1

Ⓐ

CO.1

a.

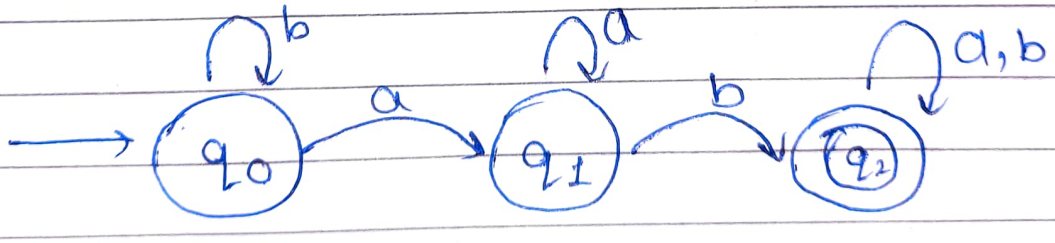
Given : $\Sigma = \{a, b\}$

String should have substring "aa"

Thus language formed by the condition will be

$L = \{baab, baaab, abaab, bbaab, baabbb, baabb, ---\}$

The DFA ~~was~~ formed will be



q_0 is starting state

q_2 is final state

a, b are symbols

Then above DFA accepts the strings which contain "aa" as substring.