

★ Theory of Computation (TOC) - Assignment Number - 2

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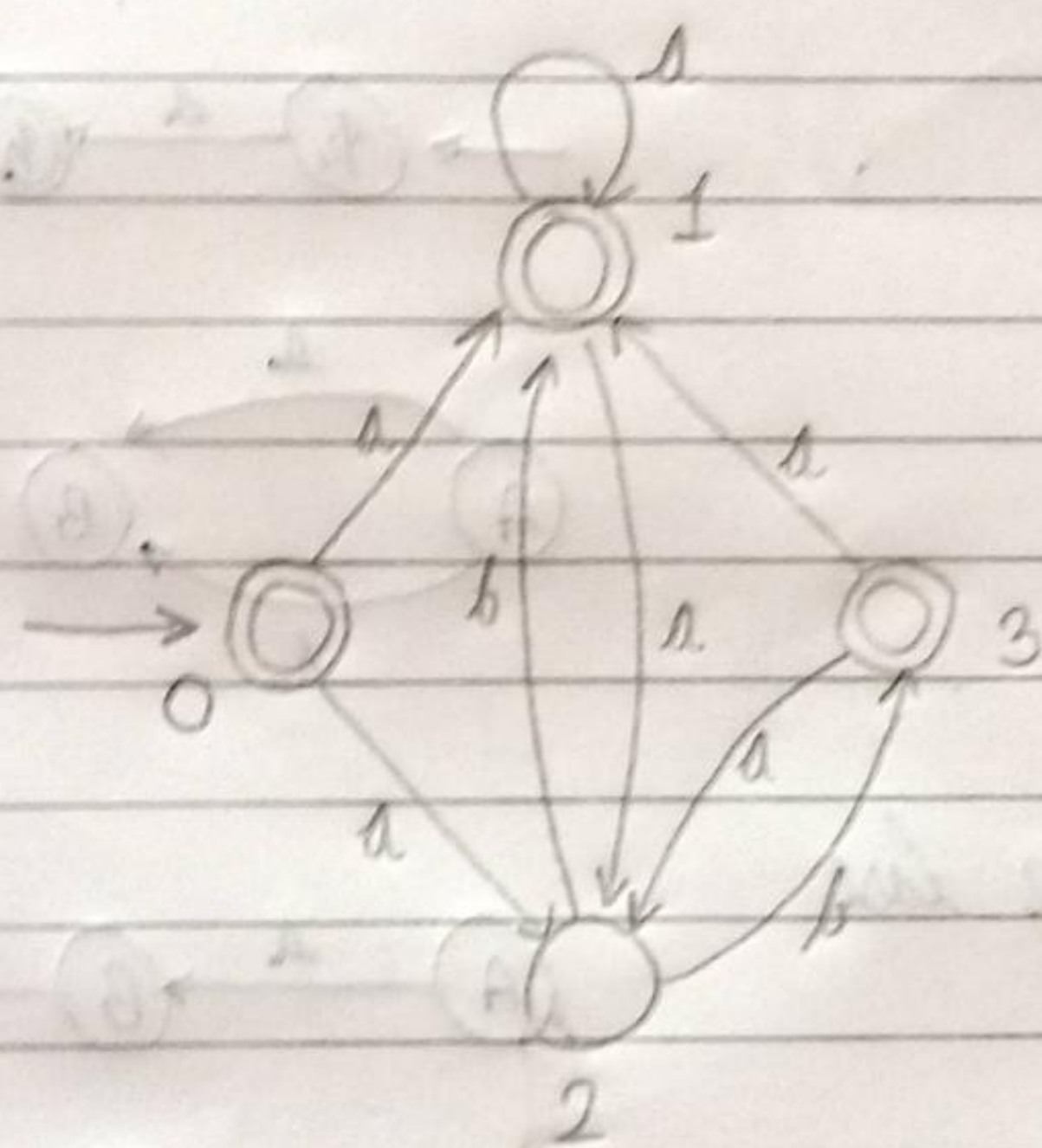
Batch:- T-2

Department:- Computer Department

College:- AISSMS's IOIT.

★ Convert NFA to DFA.

→ NFA →

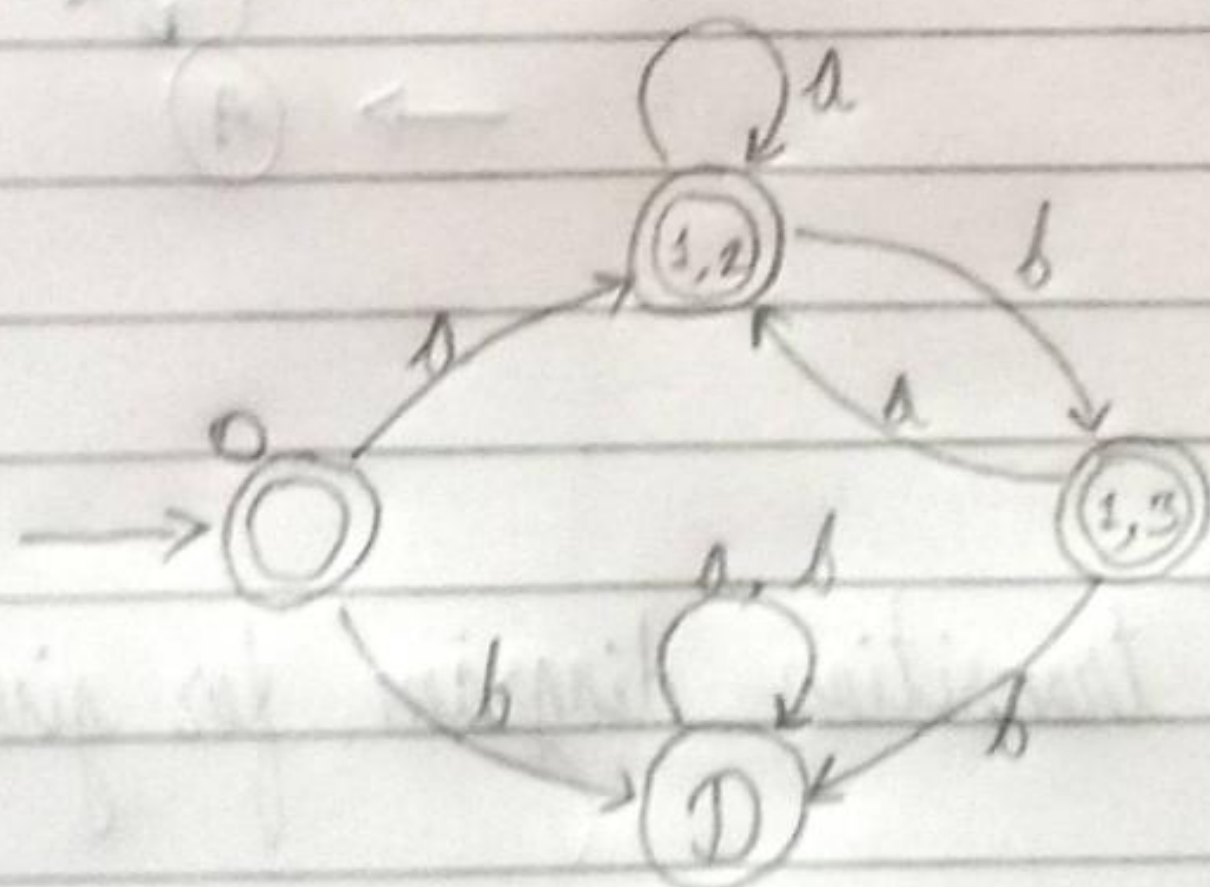


→

	a	b
0*	1, 2	∅
1*	1, 2	∅
2	∅	1, 3
3	1, 2	∅

∅ = ∅ (Dead State)

DFA →



	a	b
*0	1, 2	∅
*{1,2}	1, 2	1, 3
*{1,3}	1, 2	∅
∅	∅	∅

★ Given Rules of converting RE to NFA using Union, concatenation and closure with an example each.

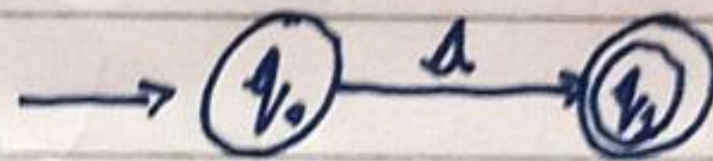
→ ① For conversion of Regular Expression to non-finite automata. We have 2 methods :-

- i) Thompson's construction
- ii) Direct method

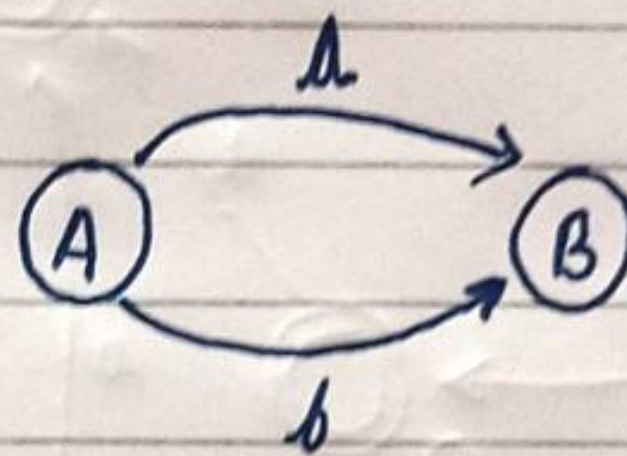
② Thompson's construction - We use some patterns

Case I: Zero Operations

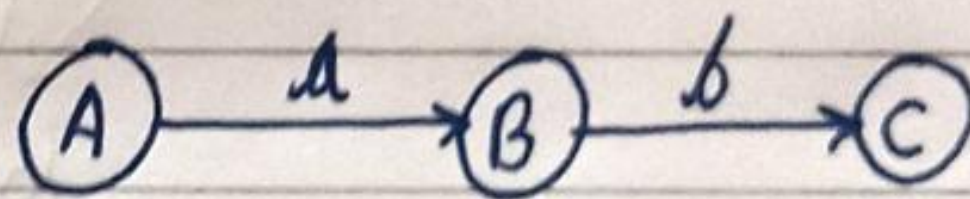
Start \rightarrow $\textcircled{q_0}$
 $r = \epsilon$



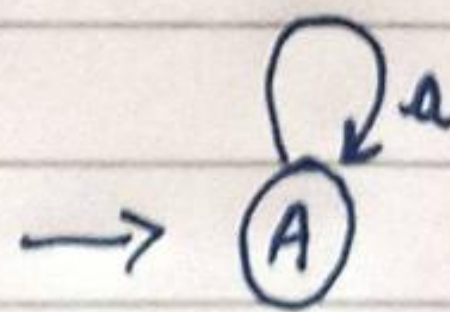
Case II: Union case.
 $R = (a + b)$



Case III: Concatenation case
 $R = (a - b)$



Case IV: Closure case
 $R = a^*$



③ Direct Method:

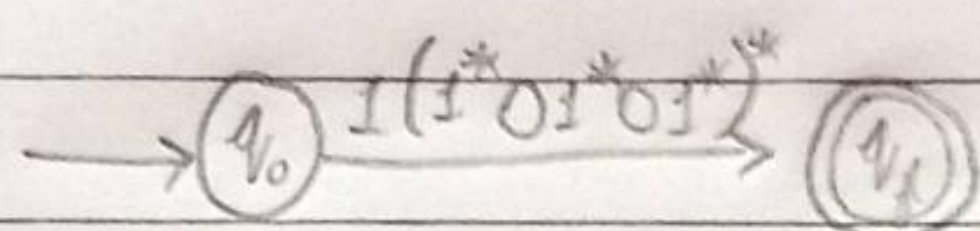
Step 1: Design a transition diagram for given RE using NFA with ϵ moves.

Step 2: Convert this NFA with E to NFA without E.
if $RE \rightarrow DFA$

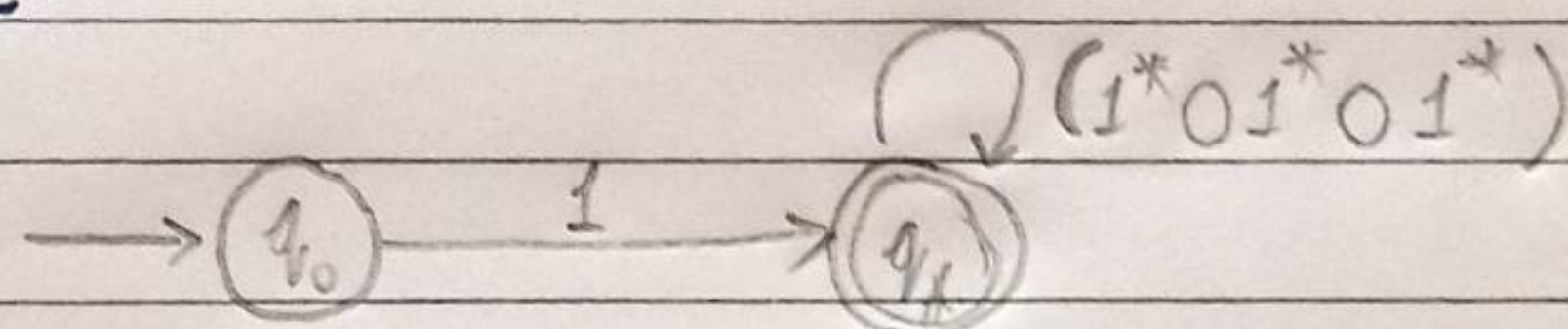
Step 3: Convert the obtained NFA to equivalent DFA

Example :- $RE = 1(1^*01^*01^*)^* \rightarrow NFA$.

Step 1:



Step 2:



Step 3:
NFA -

