Department of Computer Science and Engineering
Jahangirnagar University
3rd Year 1st Semester 2020
Quiz-3

Answer Script
Total Page# 10

Course Information							
Course Title:	Theory of Computation						
Course Code:	CSE-309		**Marks:**	15		**Time:**	27 Minutes

Instructions

1. Keep your eyes on your own paper. Remember, copying is cheating!
2. You will not be allowed to use additional sheets. Limit your answer so that it fits within the allocated space.
3. Stop writing immediately when the teacher says it is the end of the exam.
4. Scan the whole answer script and submit through Google Classroom.
5. Failing to upload the answer script within the given time span will be considered as disqualification.

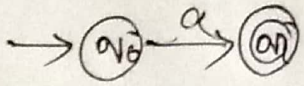
Student Information	
Full Name:	Tasmim Sultana
Class Roll:	0129
Date:	04-02-2021

Questions	Marks	Remarks
1.		
2.		
3.		
4.		
5.		
6.		
Total		

Answer to the question number (1):

(a)

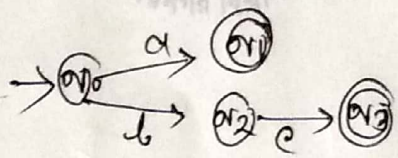
Start state : Start state is a state in which incoming arrow comes from nowhere.



In this figure q_0 is start state of the NFA.

(b)

Set of accept state : Set of accept state of a particular DFA or NFA are the states which is labelled by two rounded circle. A string ends in there kind of set is considered as accepted.



Here $\{q_1, q_3\}$ are accepting state.

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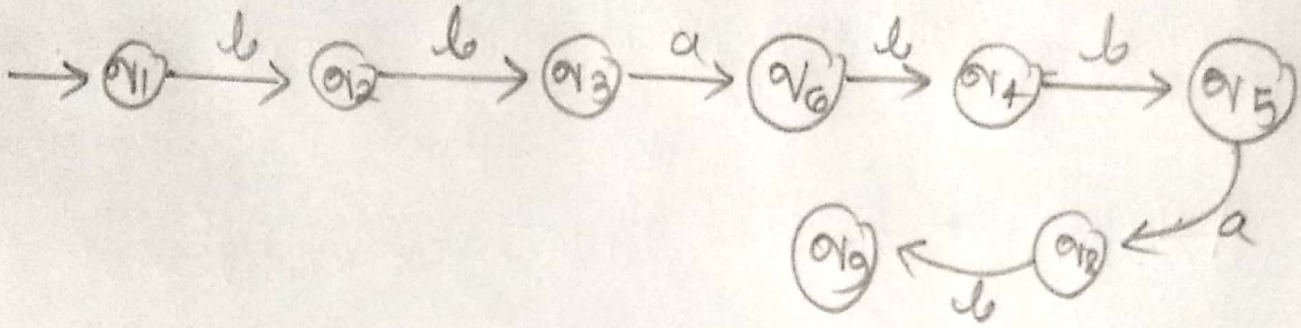
Answer to the question number (1):

(c)

Sequence of state for input "bbabbab".



(d)

Transition table for given DFA

	a	b
q_1	q_4	q_2
q_2	q_5	q_3
q_3	q_6	q_1
q_4	q_7	q_5
q_5	q_8	q_6
q_6	q_9	q_4
q_7	q_1	q_8
q_8	q_2	q_9
q_9	q_3	q_7

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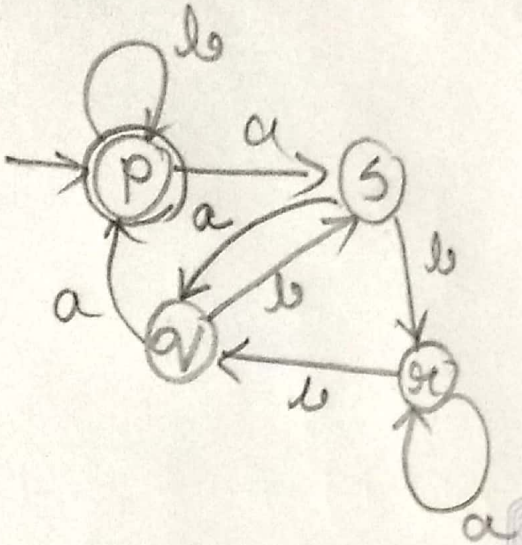
Answer to the question number (2):

Converting the following DFA to regular expression.

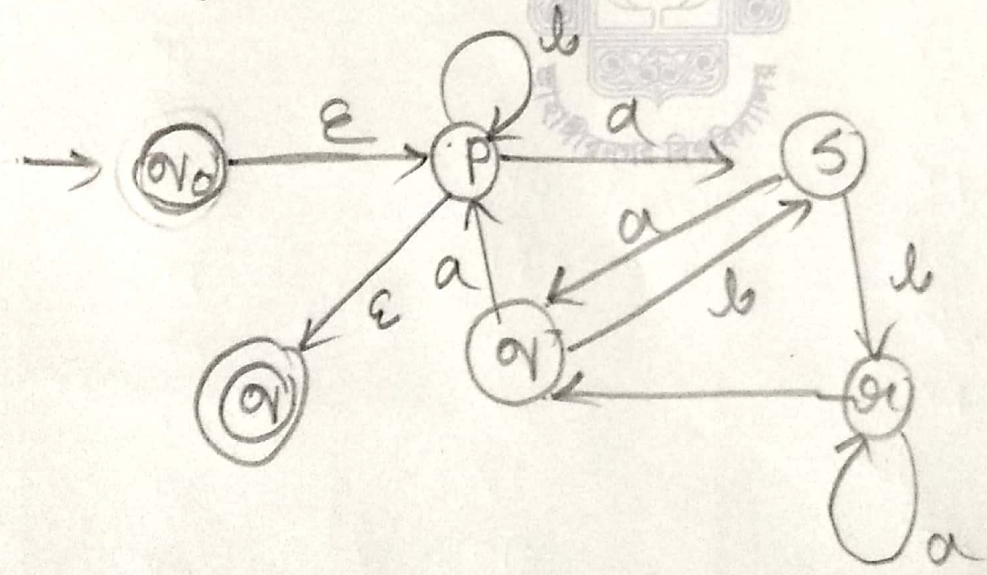


b^* $\cup$ $b^*\cup(a(ab)^*\cup(aab^*a)^*$

$b^*\cup(aba^*ba)^*\cup$

a

Converting to GNFA



RE: $b^*\cup(a(ab)^*(aab^*a)^*(ba^*ba)^*$

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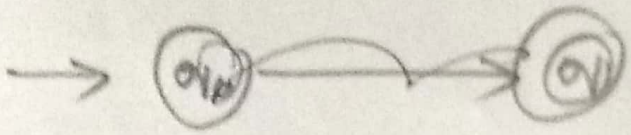
Answer to the question number (2):



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Answer to the question number (3):

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Answer to the question number (3):

Answer to the question number (4):

In terms of computation NFA is more powerfull.

(i) Cause through NFA we can prove the basic union (∪), concatenation (∘) and star (*) operation.

(ii) We can recognize language in a easy way

Formal defination of NFA –

NFA consist of 5 tuple.

they are $N = \{Q, \Sigma, \delta, q_0, F\}$

1. Q : Is the finite number of state

2. Σ : Is the finite number of alphabate

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Answer to the question number (4):

3. δ : is the transition function

$\delta(q, a) = P(q)$

4. $q = q_0$ - start state

5. F is the set of final state.