UNIVERSITI TEKNOLOGI MALAYSIA

Semester 2020/2021

Subject : Discrete Structure SECI1013

Section : 07

Task : Assignment 5

Submission : 30/01/2021

Group Number:14

	Name	Math number
1	Muhammad Muizzuddin Bin Kamarozaman (A20EC0214)	4,5
2	MD SIRAJUM MUNEER (A20EC4035)	1
3	G M SHAHEEN SHAH SHIMON (A20EC0266)	2,3

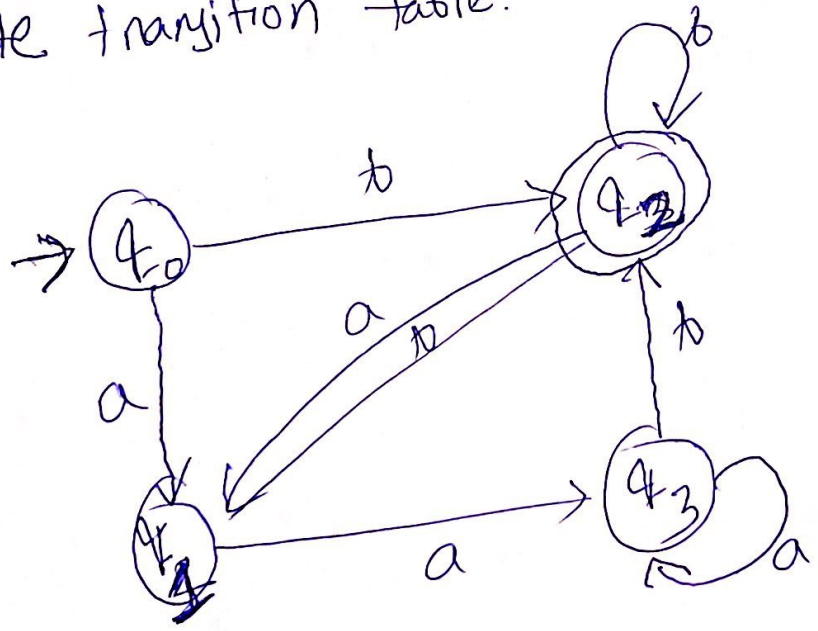
Lecturer: Dr. Haswadi bin Hassan

Question 1

Transition table (fs)

	a	b
→ q_0	q_1	q_2
q_1	q_3	q_2
q_2	q_1	q_2
q_3	q_3	q_2

State transition table:

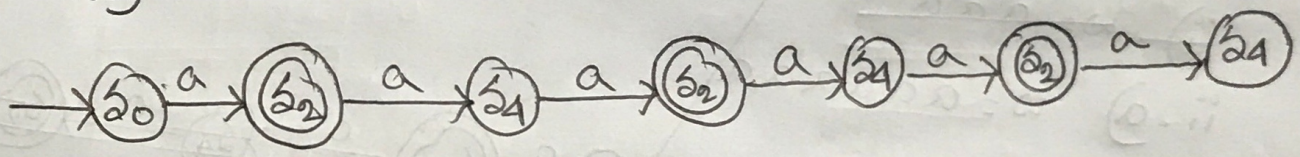


Question 2

i)

f_δ	a	b
s_0	s_2	s_1
s_1	s_3	s_1
s_2	s_4	s_3
s_3	s_3	s_3
s_4	s_2	s_3

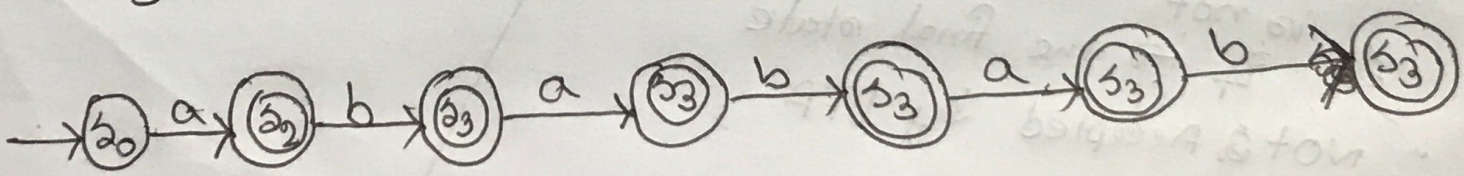
ii.a) $w = a\,a\,a\,a\,a\,a$



s_4 is not the final state

$\therefore$ Not Accepted by DFA.

b) $w = a\,b\,a\,b\,a\,b$



s_3 is the final state

$\therefore$ Accepted by DFA.

Question 3

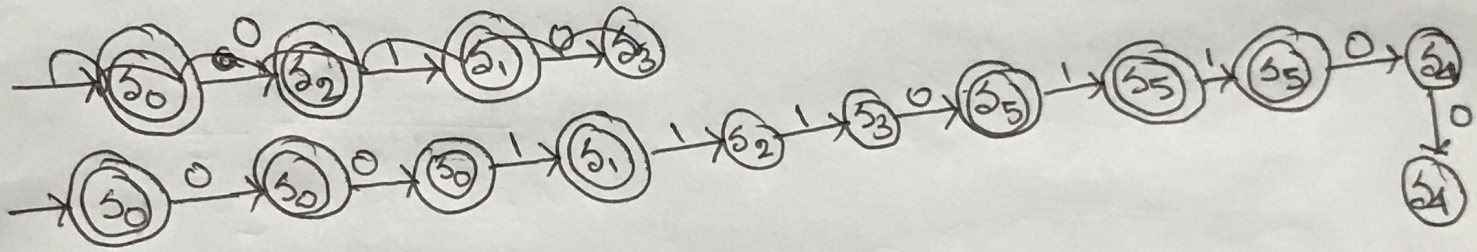
i) (a) $S = \{S_0, S_1, S_2, S_3, S_4, S_5\}$.

$I = \{0, 1\}$.

$q_0 = S_0$

$F = \{S_0, S_1, S_5\}$.

b) $w = 0011101100$.

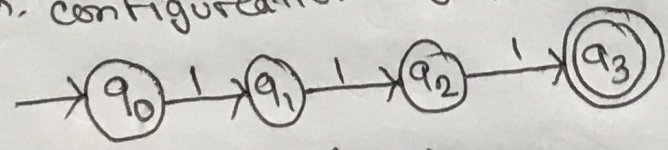


S_4 is ~~notte~~ not the final state

∴ not Accepted by DFA

ii) Minimum string = {1,1,1} input = {0,1}

Rough configuration of state transition



$f_D(q_0, 0) = q_0$ $f_D(q_3, 0) = q_3$

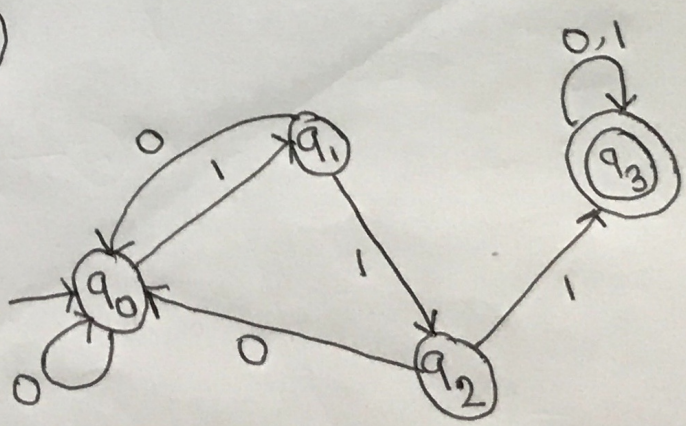
$f_D(q_0, 1) = q_1$ $f_D(q_3, 1) = q_3$

$f_D(q_1, 0) = q_0$

$f_D(q_1, 1) = q_2$

$f_D(q_2, 0) = q_0$

$f_D(q_2, 1) = q_3$



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Question 4

	Input	Output
W = wander	not enemies	shoot
E = evade	enemies and not vulnerable	not shoot
A = attack	enemies and vulnerable	

X = not enemies

Y = enemies and not vulnerable

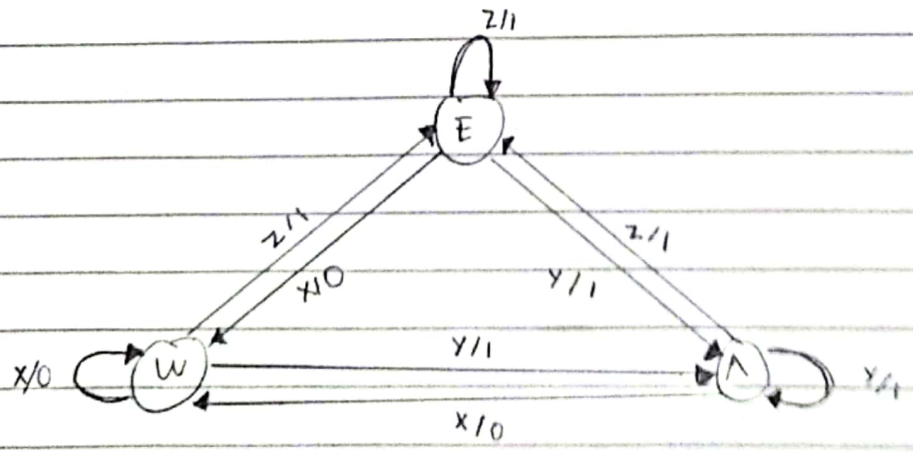
Z = enemies and vulnerable.

Output,

Shoot = 1

Not shoot = 0

Tc	Input			Output		
	X	Y	Z	X	Y	Z
W	W	A	E	0	1	1
E	W	A	E	0	1	1
A	W	A	E	0	1	1



No.: Date:

Question 5

Draw the transition diagram for the above system.

Answer.

Fs	input									Output								
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I
S_1	S_2									0								
S_2		S_3	S_9								0	1						
S_3				S_6	S_4								0	0				
S_4				S_6	S_5								0	0				
S_5				S_6	S_9								0	2				
S_6						S_7									0			
S_7							S_8									0		
S_8								S_6	S_9								0	1
S_9