YASIR FAHEEM

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Compiler Construction

Q:NO:1:—
Construct regular expression defining each of the following language over the alphabet $\Sigma = \{a, b\}$

Ans:—
(i) ADD words having odd length.
$(a,b)((a,b)(a,b))^*$

ii) ADD words having two a's & tonw b's.
$(a,b)^*(aa)(bb)(a,b)^*$

iii) ADD words having triple a's or double b's
$(a,b)^*(aaa)(a,b)^* + (a,b)^*(bb)(a,b)^*$

iv) all words start with double a's or tripple b's.

$aa(a,b)^* + bbb(a,b)^*$

Q:NO:2 For figure 3 if q_0 is the initial state, the draw a trasition table for it.

Ans:—

	a	b
Q_0	Q_4	Q_1
Q_1		Q_2
Q_2	Q_3	
Q_3		Q_1
Q_4		Q_5
Q_5	Q_4	

Q.NO: 3

Define what is finite automaton. what can be the regular expression of the digram given in figure 1.

Ans:—

Finit Automaton

Finite Automaton is the simplest machine to recognize patterns.

It takes the string of symbol as input and changes its state accordingly. when the desired symbol is found then the transition occurs.

at the time of transition the automaton can either move to the next state or stay in the same state.

A finite automaton consist of the following.

Finite set of state
set of input symbols
initial state
set of Final states
Transition Function

Regular expression of given figure is

$b(a+b)^* + a(a+b)^*$

Q.NO:4

Draw a Transition table for the diagram give in figure 2. (0) is the starting state and (dotted lines are dead states.

Ans:-

	a	b	c	D	e	f	g	h
0	1				2			
1	1	3			2			
2	1				2	4		
3	5		6		7			
4	8				9		10	
5	5		6		7			
6			6	11	7			
7			6		7	12		
8	8				9		10	
9	8				9		10	
10					9		10	13
11	6		6		7			
12	14		15		16			
13	8				9		10	
14	14		15		16		17	
15			16	18			17	
16	14		15		16		17	
17	14		15		16		17	19
18	14		15		16		17	
19	14		15		16		17	