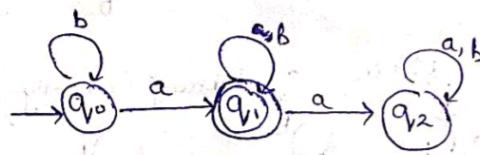
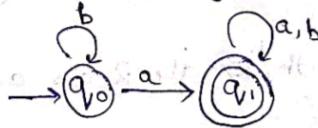


① Set of all strings with exactly one a.

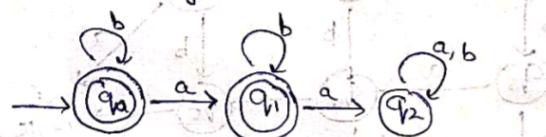


② Set of all strings with atleast one a.

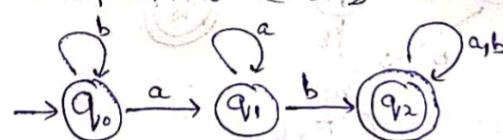


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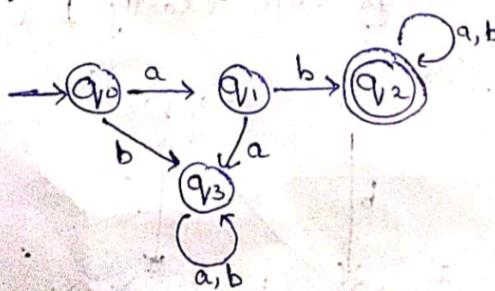
③ Set of all strings with atleast one a.



④ $L = \{ w_1 a b w_2 \mid w_1, w_2 \in (a, b)^*\}$ or containing substring ab

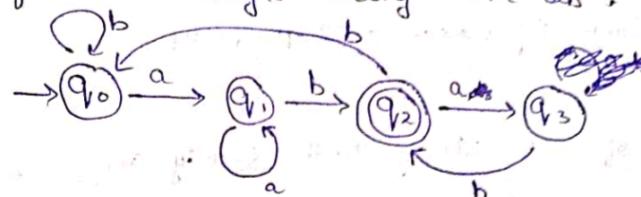


⑤ Set of all strings starting with ab



⑥

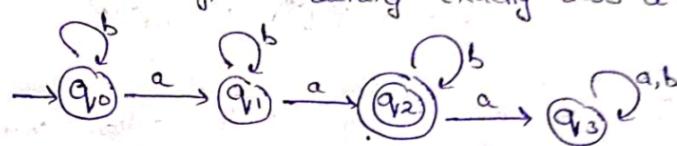
Set of all strings ending with ab.



(2)

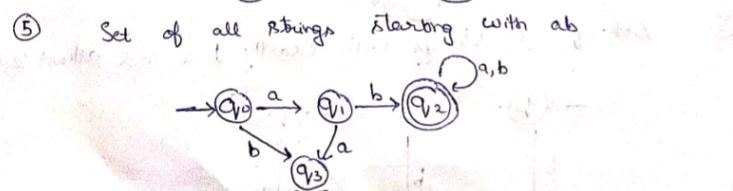
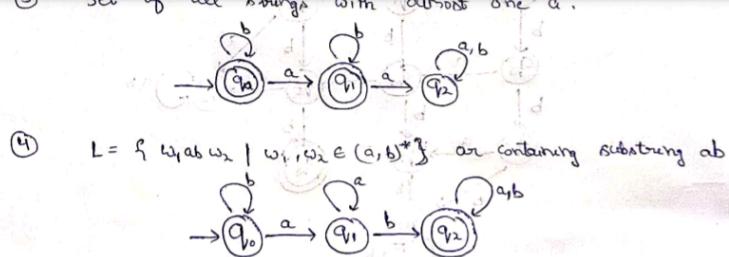
⑦

Set of all strings containing exactly two a's.

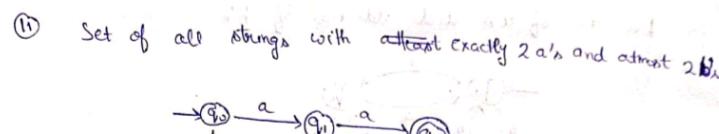
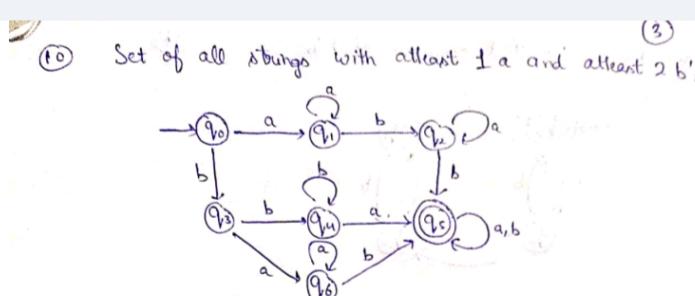
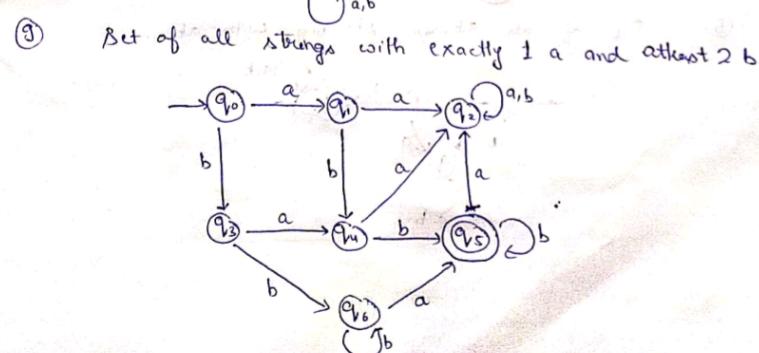
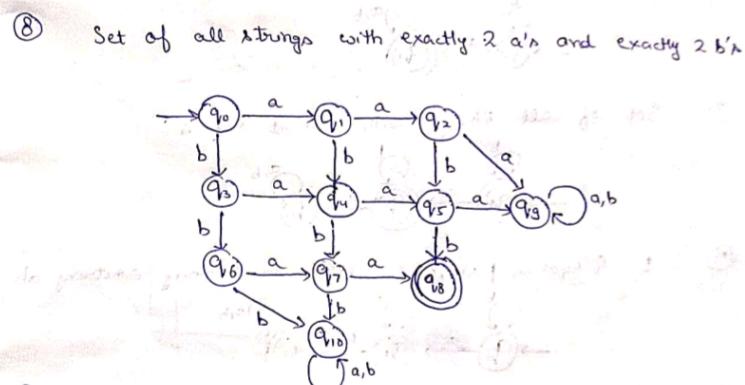
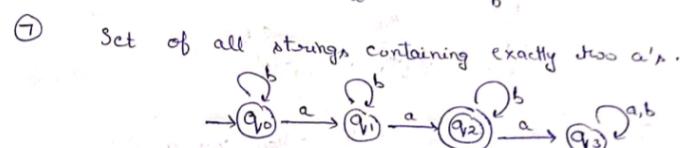
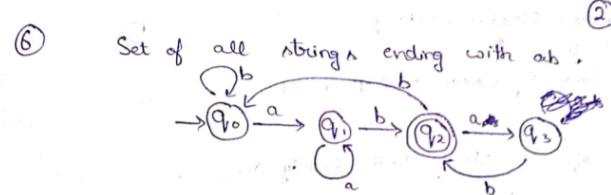


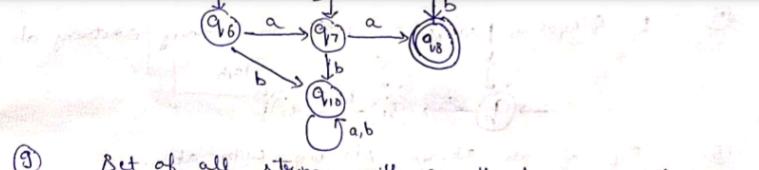
⑧

Set of all strings with exactly 2 a's and exact

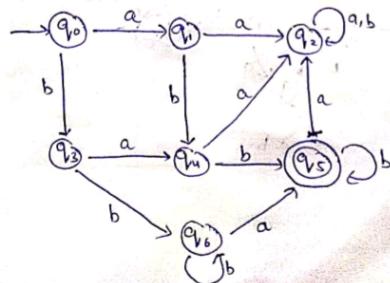


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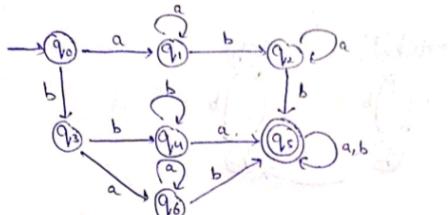


(9) Set of all strings with exactly 1 'a' and at least 2 'b's

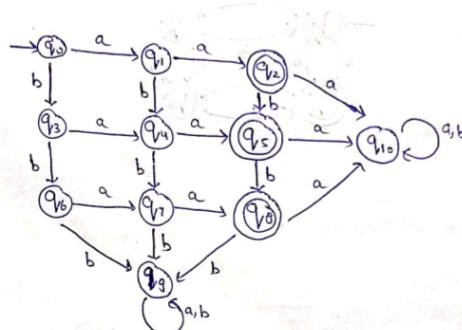


(3)

(10) Set of all strings with at least 1 'a' and at least 2 'b's



(11) Set of all strings with at least exactly 2 'a's and at least 2 'b's



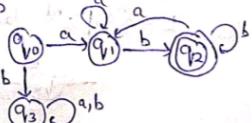
(21) Odd no. of 'a's



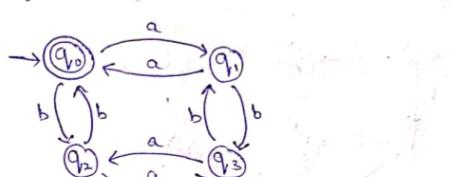
(22) Even no. of 'a's



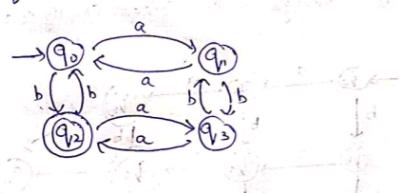
(23) Starting with 'a' and ending with 'b'



(24) Even no. of 'a's and even no. of 'b's



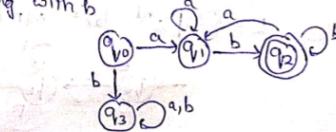
(25) Even no. of 'a's and odd no. of 'b's



(22)

Even no. of a 's

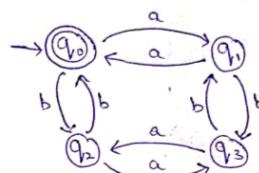
(23)

Starting with a and ending with b 

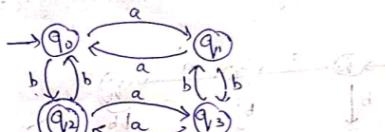
(24)

Even no. of a 's and even no. of b 's

(4)



(25)

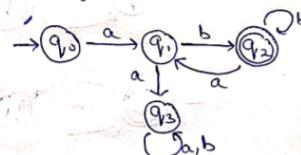
Even no. of a 's and odd no. of b 's

(26)

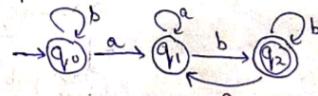


(27)

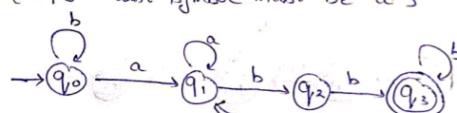
Not containing "aa" as substring



(28)

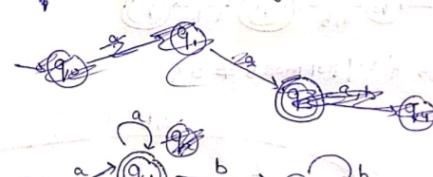
 $L = \{w \mid 2^{\text{nd}} \text{ last symbol must be } 'a'\}$ 

(29)

 $L = \{w \mid 3^{\text{rd}} \text{ last symbol must be } 'a'\}$ 

(30)

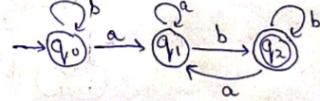
Set of all strings that begin and end with same letter



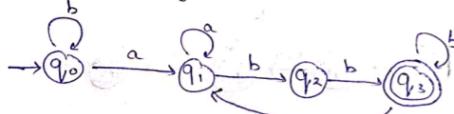
(31)

 $L = \{w \mid \text{second last symbol should be } 'a'\}$

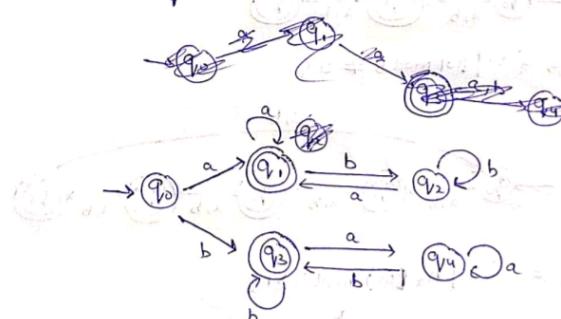
28) $L = \{ w \mid 2^{\text{nd}} \text{ last symbol must be 'a'} \}$



29) $L = \{ w \mid 3^{\text{rd}} \text{ last symbol must be 'a'} \}$

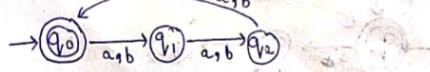


30) Set of all strings that begin and end with same letter

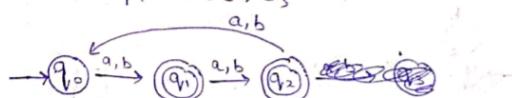


31) $L = \{ w \mid \text{second last symbol should be different from first symbol} \}, l(w) > 3$

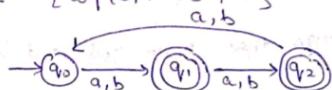
32) $L = \{ w \mid |w| \bmod 3 = 0 \}$



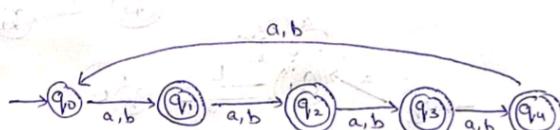
13) $L = \{ w \mid |w| \bmod 3 > 0 \}$



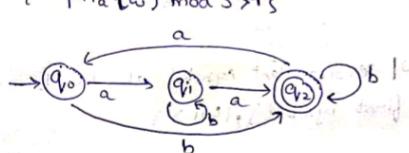
14) $L = \{ w \mid |w| \bmod 3 \neq 0 \}$

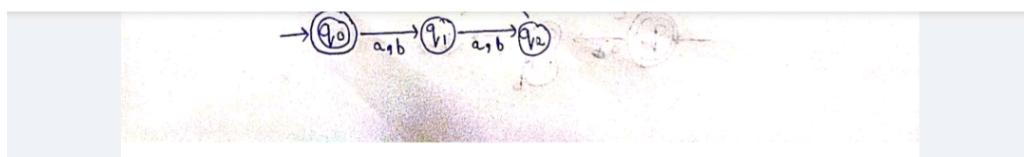


15) $L = \{ w \mid |w| \bmod 5 \neq 0 \}$

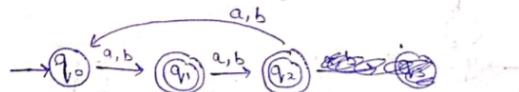


16) $L = \{ w \mid n_a(w) \bmod 3 > 1 \}$

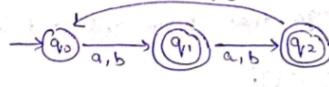




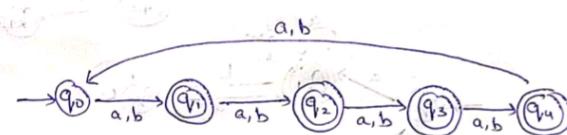
(13) $L = \{ w \mid |w| \bmod 3 > 0 \}$



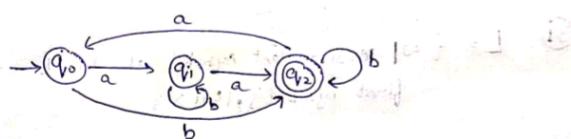
(14) $L = \{ w \mid |w| \bmod 3 \neq 0 \}$



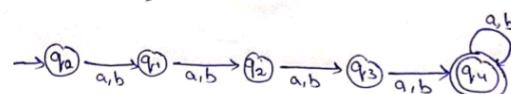
(15) $L = \{ w \mid |w| \bmod 5 \neq 0 \}$



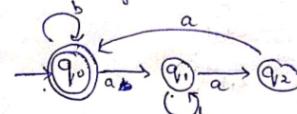
(16) $L = \{ w \mid n_a(w) \bmod 3 > 1 \}$



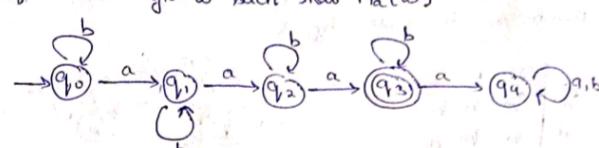
(17) $L = \{ w \mid |w| \geq 4 \}$



(18) Set of all strings w such that $n_a(w)$ is divisible by 3



(19) Set of all strings w such that $n_a(w) = 3$

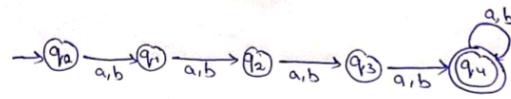


(20) $L = \{(ab)^i (b)^{2j} \mid i \geq 1, j \geq 1\}$

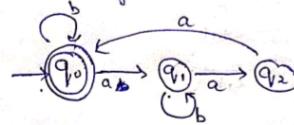
For $\Sigma = \{a, b\}$ design DFA for the following

(21) Set of all binary numbers whose decimal equivalent is divisible by 3

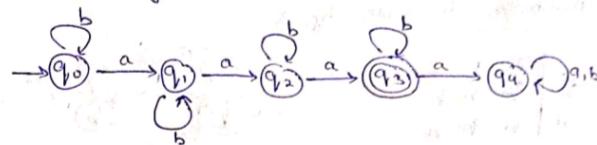
$$⑦ L = \{w \mid |w| \geq 4\}$$



⑧ Set of all strings w such that $n_a(w)$ is divisible by 3



⑨ Set of all strings w such that $n_a(w) = 3$



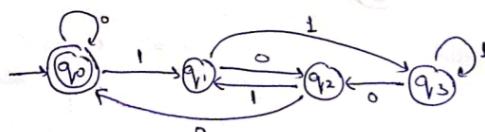
⑩ $L = \{(ab)^i (b)^{2j} \mid i \geq 1, j \geq 1\}$

For $\Sigma = \{a, b\}$ design DFA for the following

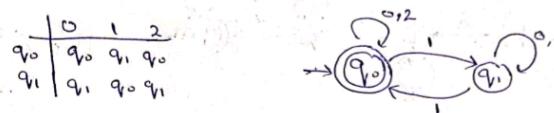
⑪ Set of all binary number whose decimal equivalent is divisible by 3

For $\Sigma = \{0, 1\}$ design DFA for the following

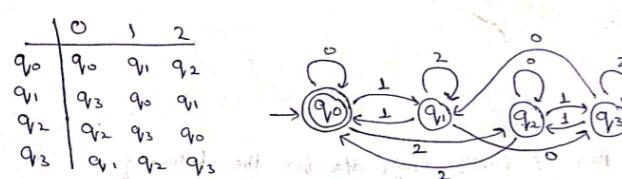
⑫ Set of all binary number whose decimal equivalent is divisible by 4



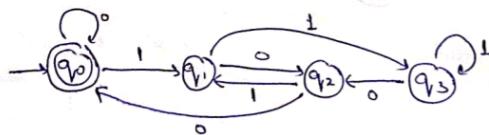
⑬ For $\Sigma = \{0, 1, 2, 3\}$ design a DFA that will accept all ternary numbers divisible by 2



⑭ For $\Sigma = \{0, 1, 2, 3\}$ design a DFA that will accept all ternary numbers divisible by 4



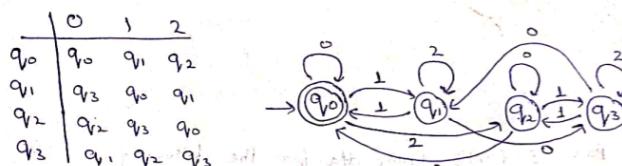
- 33) Set of all binary numbers whose decimal equivalent is divisible by 4



- 34) For $\Sigma = \{0, 1, 2\}$ design a dfa that will accept all ternary numbers divisible by 2



- 35) For $\Sigma = \{0, 1, 2, 3\}$ design a dfa that will accept all ternary number divisible by 4

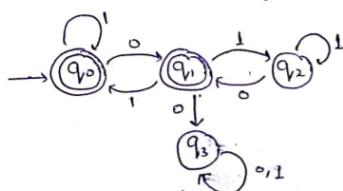


- 36) For $\Sigma = \{0, 1\}$ design dfa for accepting all those strings in which number of 0's is divisible by 2 and number of 1's is divisible by 3

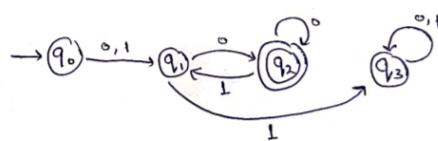
$\rightarrow (q_0)$



- 37) $\Sigma = \{0, 1\}$ dfa for all strings not containing '00'.



- 38) $\Sigma = \{0, 1\}$ design a dfa that will accept all those binary numbers whose decimal equivalent is divisible by 2 but not divisible by 3.



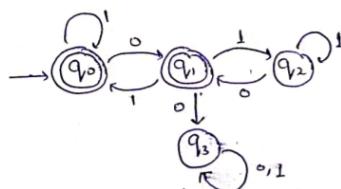
- 35) For $\Sigma = \{0, 1, 2\}$ design a dfa that will accept all ternary numbers divisible by 4.

	0	1	2
q_0	q_0	q_1	q_2
q_1	q_3	q_0	q_1
q_2	q_2	q_3	q_0
q_3	q_1	q_2	q_3

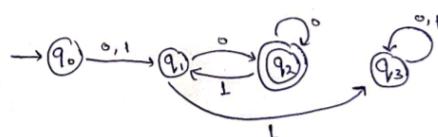
- 36) For $\Sigma = \{0, 1\}$ design dfa for accepting all those strings in which number of 0's is divisible by 2 and number of 1's is divisible by 3.



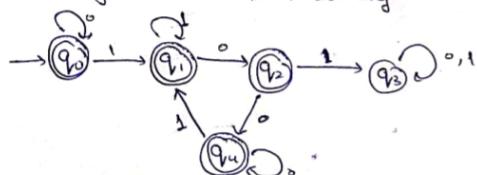
- 37) $\Sigma = \{0, 1\}$ dfa for all strings not containing '00'.



- 38) $\Sigma = \{0, 1\}$ design a dfa that will accept all those binary numbers whose decimal equivalent is divisible by 2 but not divisible by 3.



- 39) $\Sigma = \{0, 1\}$ Design a dfa to accept all those strings not containing '101' as substring.



- 40) $\Sigma = \{0, 1\}$. Design a dfa to accept all those binary numbers whose decimal equivalent is divisible by 2 or divisible by 3.