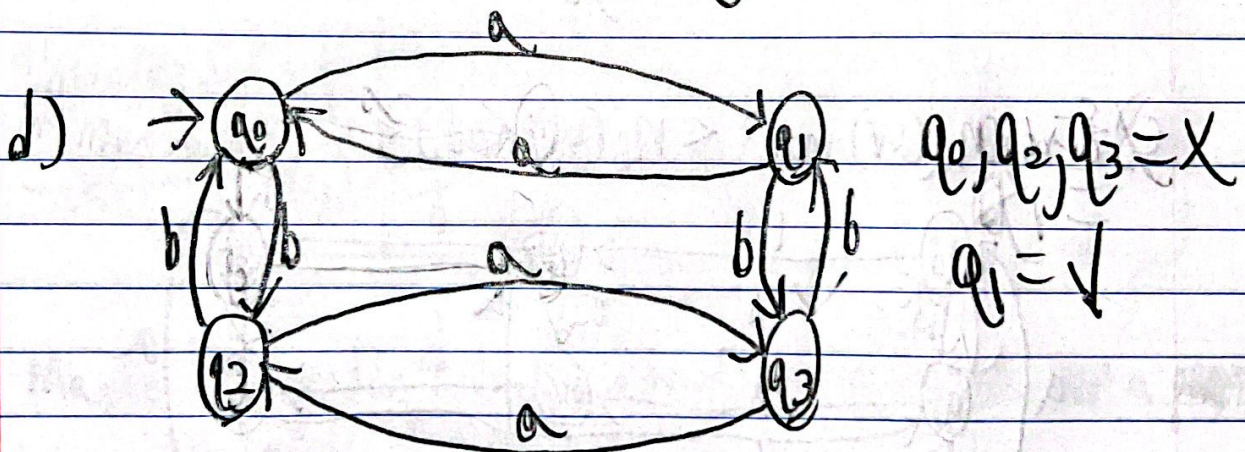
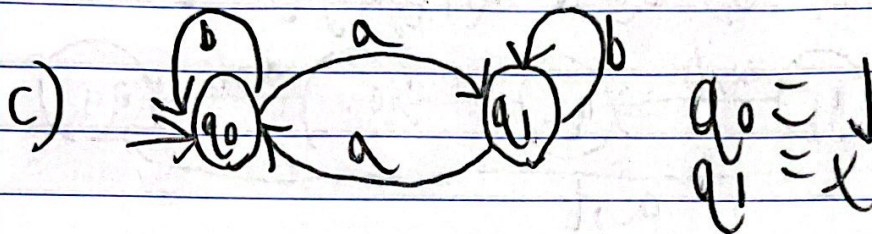
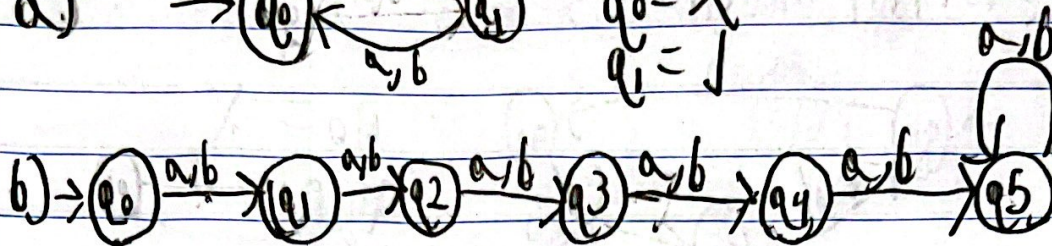
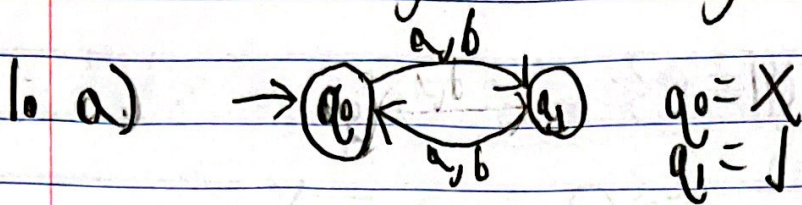
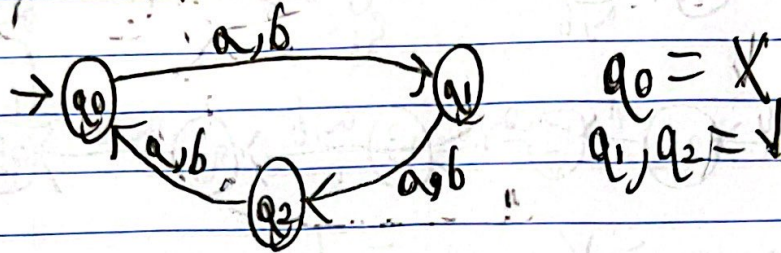


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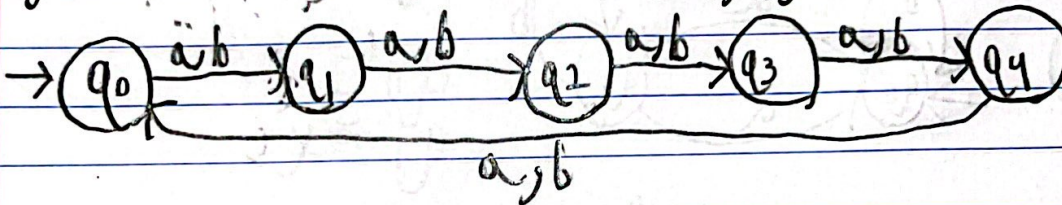


Page 2

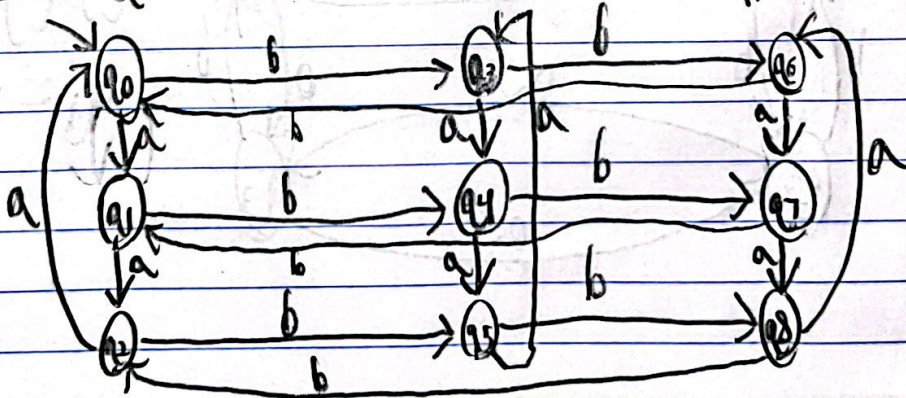
2. a) $\{w: |w| \bmod 3 \neq 0\}$



b) $\{w: |w| \bmod 5 = 0\}$ $q_0 = \checkmark$ $q_1, q_2, q_3, q_4 = X$



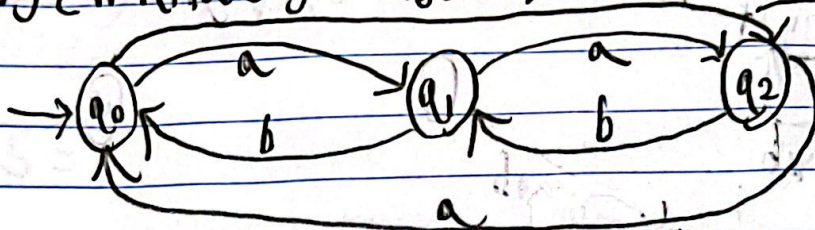
c) $\{w: n_a(w) \bmod 3 < n_b(w) \bmod 3\}$ * Really shouldn't have drawn this, huh



$q_0, q_1, q_2, q_4, q_5, q_8 = X$ $q_3, q_6, q_7 = \checkmark$

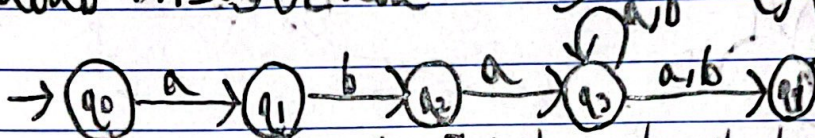
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d) $\{w : (n_a(w) - n_b(w)) \bmod 3 = 0\}$ $q_0 = \checkmark$



$q_1, q_2 = \times$

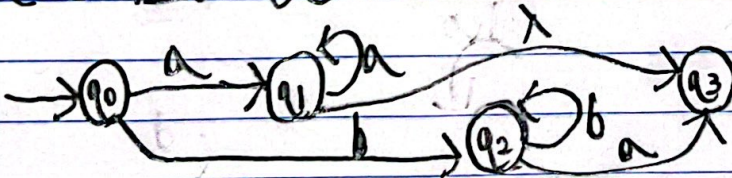
3. $\{abab^n : n \geq 0\} \cup \{aba^n : n \geq 0\}$ $q_0, q_1, q_2, q_4 = \times$
 $q_3 = \checkmark$



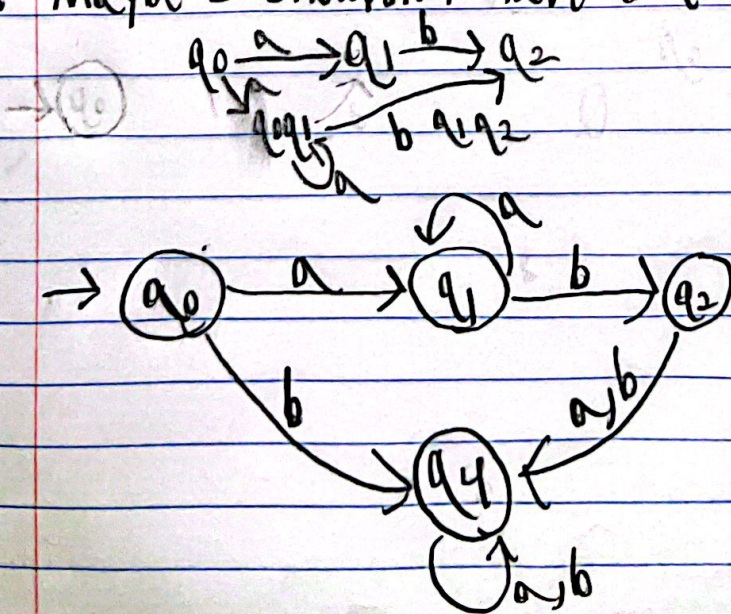
Assuming you meant 5 internal states

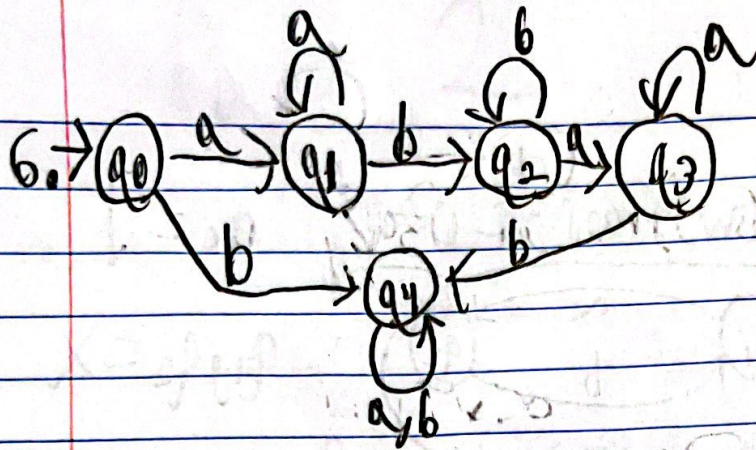
4. $\{a^n : n \geq 0\} \cup \{b^n a : n \geq 1\}$

$q_0, q_1, q_2 = \times$
 $q_3 = \checkmark$

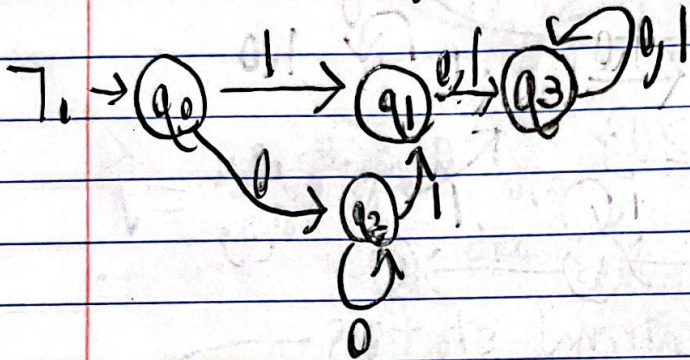


5. Maybe I shouldn't have drawn them, but in for a penny...





$q_1, q_2, q_3 = \checkmark$
 $q_0, q_4 = \times$



$q_0, q_3 = \times$
 $q_1, q_2 = \checkmark$