

NAME # Hasnaat Amin  
ID NO # 6983  
Subject # Compiler Construction  
Department # BS (CS)  
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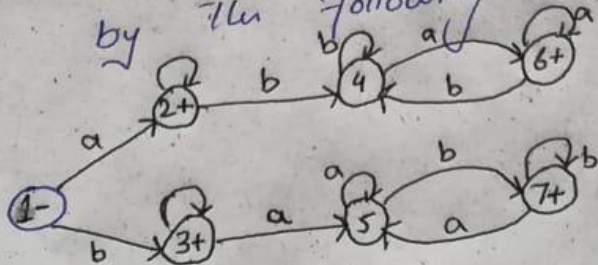
Q1) Build an FA accepting the language  $L$  of strings defined over  $\Sigma = \{a, b\}$ , beginning with and ending in same letters.

Ans Solution:-

The language  $L$  may be expressed by the following regular expression

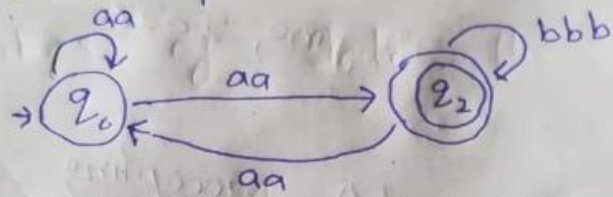
$$(a+b)^+ a(a+b)^* a + b(a+b)^* b$$

This language  $L$  may be accepted by the following FA



Q2) Build an FA accepting the language  $L$  of strings, defined over  $\Sigma = \{a, b\}$  having quadruple's or triple b's

Ans An FA which has quadruple's or triple b's



Q3) Construct regular expression defining each of the following language over the alphabet  $\Sigma = \{a, b\}$

i) All words having even length

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

ii) All words having at least three or triple b

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

iii) All words having at least double or triple b

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



iv) All words start with double or quadruple b

aa + bbb (a+b)

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Q4) Distinguish between .....

Ans Mealy Machine

1) A mealy machine generates an output based on its current state and output, so the state diagram will include both an input and output signal for each transition edge.

2) The output change asynchronously will enable clock edge

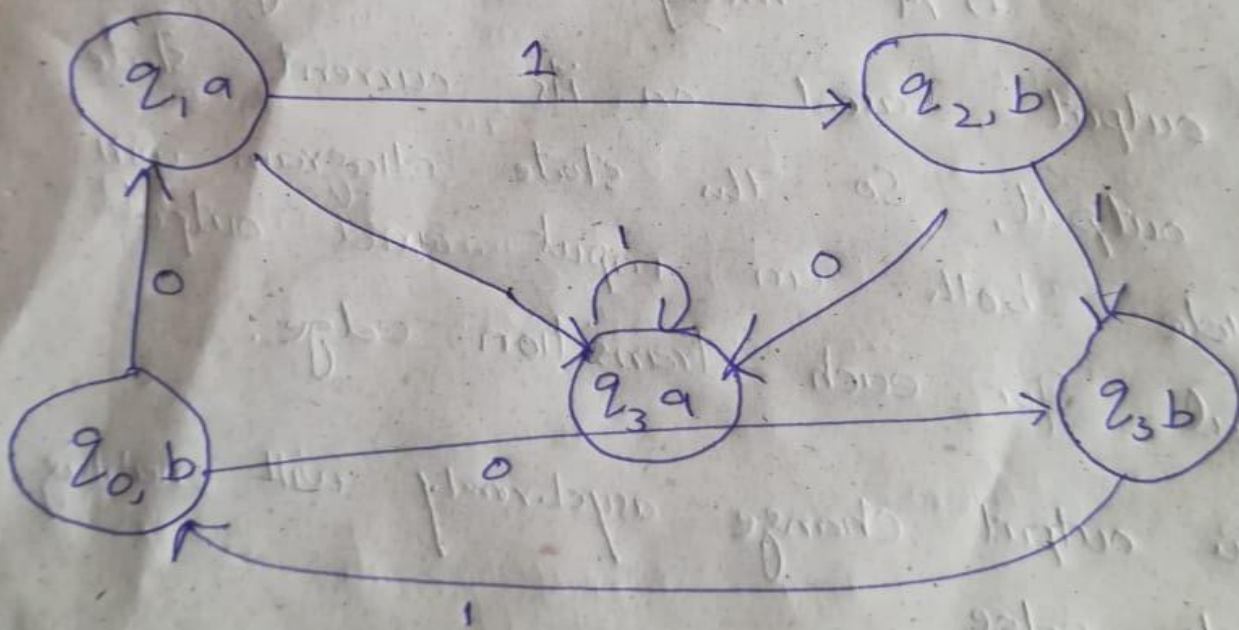
3) Mealy machine will have the same number of power

Moore Machine

The output of Moore machine depend upon the machine current state transition or not directly depend upon input.

The output change when the state changes synchronous with the enabling clock edge. output change synchronous clock edge

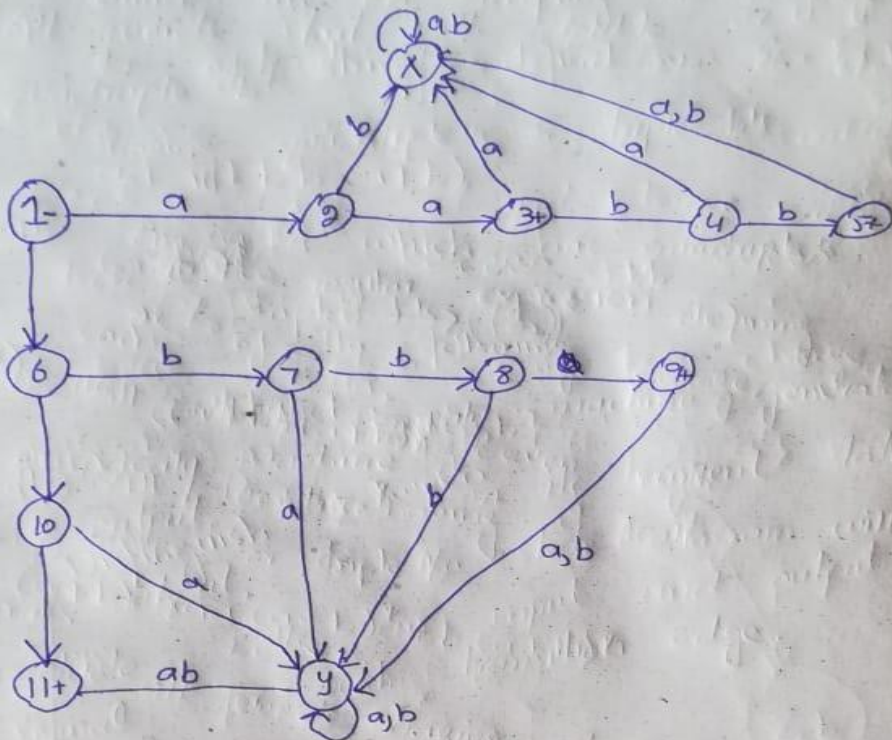
Moore machine can have change numbers of state the mealy machine.



(mealy to moore conversion)



Q6)



transition table

|     | a  | b |
|-----|----|---|
| 1-  | 2  | 6 |
| 2   | 3  | X |
| 3+  | X  | 4 |
| 4   | X  | 5 |
| 5+  | X  | X |
| 6   | 10 | 7 |
| 7   | Y  | 8 |
| 8   | Y  | Y |
| 9+  | Y  | Y |
| 10  | Y  | Y |
| 11+ | Y  | X |
| X   | Y  | Y |