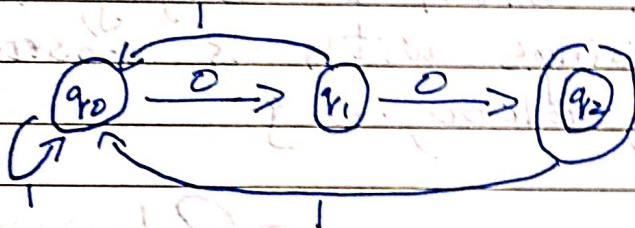


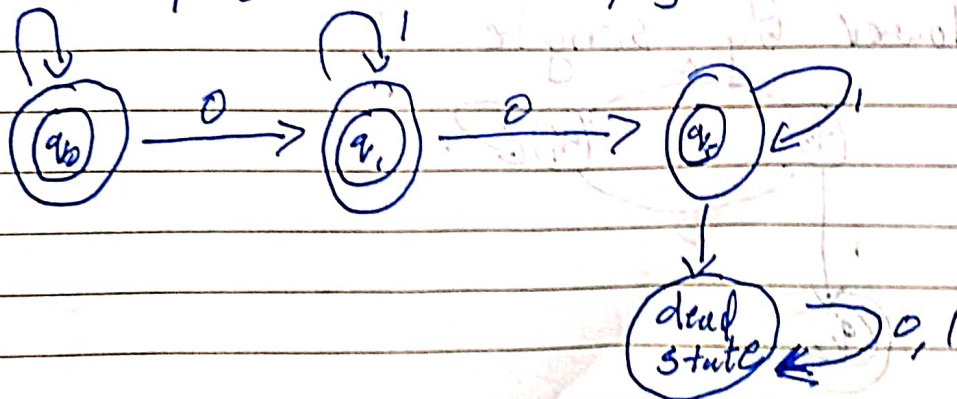
## Assignment - 5.

1)

a) Design a DFA with  $\Sigma = \{0, 1\}$  accepts the strings ending with '00' over input alphabets  $\Sigma = \{0, 1\}$

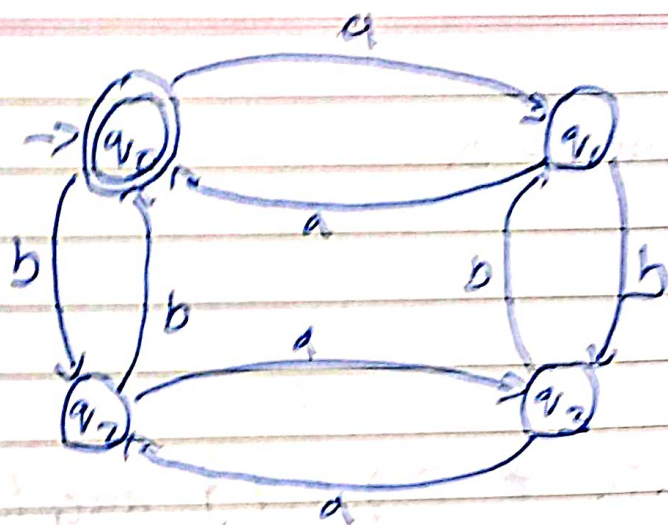


b) Draw a DFA for the language accepting strings containing at most two '0' over input alphabets  $\Sigma = \{0, 1\}$

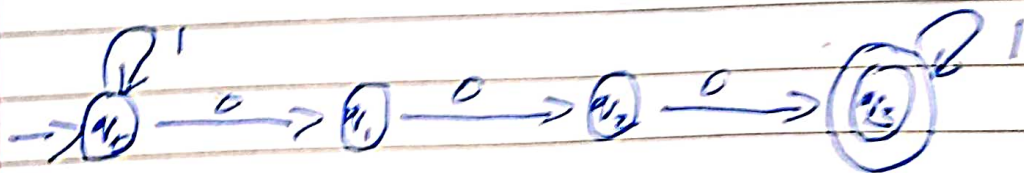


c) Design a DFA with  $\Sigma = \{a, b\}$  accepts those strings which has even numbers of 'a' and even nos of 'b'

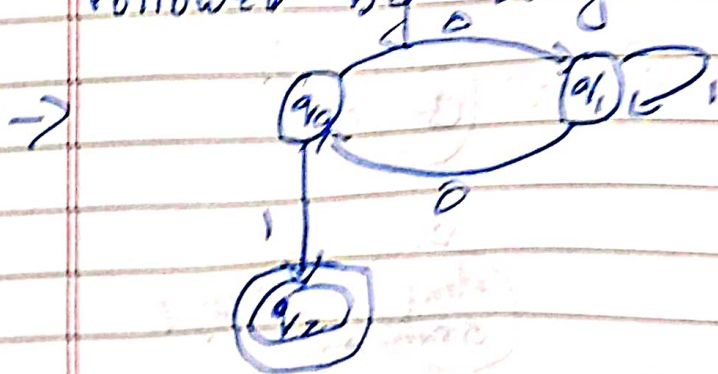
→  $L = \{ \epsilon, aa, bb, abab, baab, aabbb, aabbbbbb, \dots \}$



d) Design a DFA with  $\Sigma = \{0, 1\}$  accepts the set of all strings with 3 consecutive '0's.  
 $\rightarrow L = \{000, 0001, 1000, \dots\}$



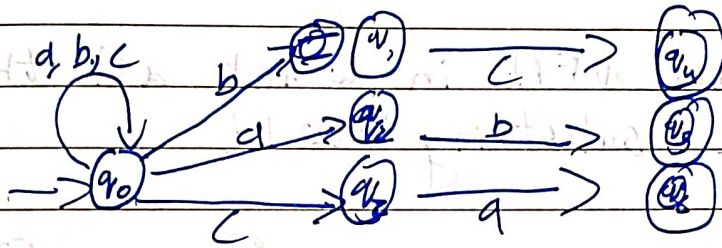
f) Construct a DFA with  $\Sigma = \{0, 1\}$  accepts the strings with an even number of '0's followed by single '1'.



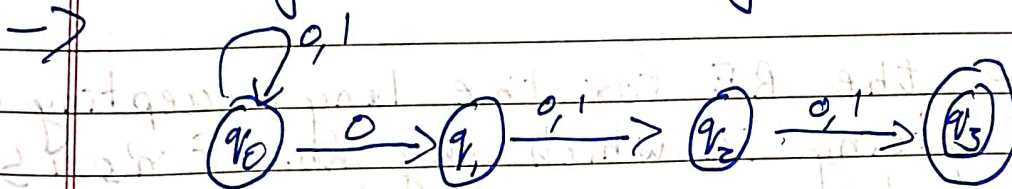


2.) NFA

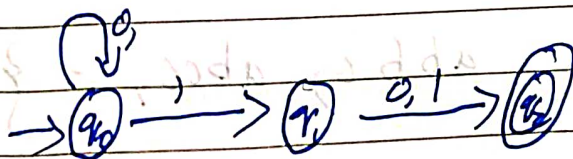
1.) Construct an NFA for the language of all strings over  $\{a, b, c\}$  that with one of  $ab, bc$  and  $ca$ .



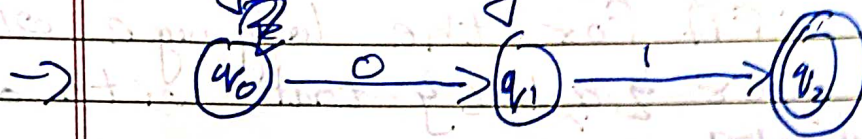
2.) Construct an NFA with  $\{0, 1\}$  accepts all strings  $i$  which the third symbol from the right end is always 0.



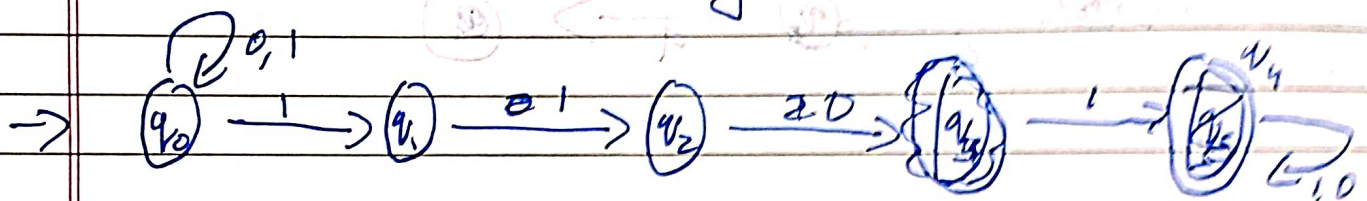
3.) Design a NFA of all binary strings in which second last bit is 1.  
 $\rightarrow L = \{10, 010, 000010, 11 \dots\}$



4.) Design an NFA with  $\Sigma = \{0, 1\}$  accepts all strings ending with '01'.



5.) Construct an NFA in which all the strings contains a substring '1101'.



3.) RE

1.) Write the RE for the lang. accepting all the string in which any no. of 'a's is followed by any no. of 'b's followed by any no. of 'c's

→ Any no. of 'a's =  $a^*$   
 'b's =  $b^*$   
 'c's =  $c^*$

$L = \{abc, aabc, abbc, abcc, \dots\}$

RE

$R = a^* b^* c^*$



2) Write the RE for lang. accepting all the strings which are starting with 1 and ending with 0, over  $\Sigma = \{0, 1\}$

→  $RE = 1(0+1)^*0$

3) Describe the language denoted by foll RE

$(b^* (aaa)^* b^*)^*$

→  $RE = (\text{any combn of b's}) (aaa)^* (\text{any combn of b's})$

$L =$  The language consists of the strings in which a's appear triplets, there is no restriction on b's

$L = \{ baaab, bb aaab, bb aaabb, \dots \}$

4) Write RE for the language  $L$  over  $\Sigma = \{0, 1\}$  such that all the strings do not contain the substring '01'.

→  $L = \{ \epsilon, 0, 1, 10, 11, 100, \dots \}$

$RE = (1^* 0^*)$