31) Automata theory is the study of abstract machines and automata, as well as the computational problems that can be solved by them. A deterministic finite automata (DFA) is represented by a 5-tuple $< Q, \Sigma, \delta, q_0, f >$ where

$Q$ is a finite set of states

$\Sigma$ is the finite set of symbols

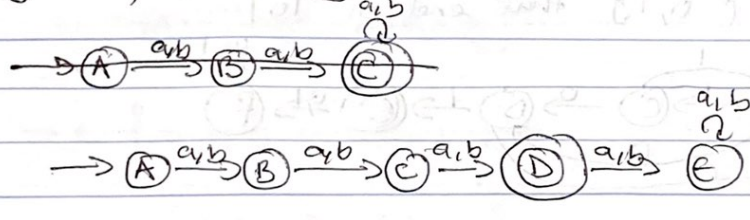
$\delta$ is the transition function

$q_0$ is the start state

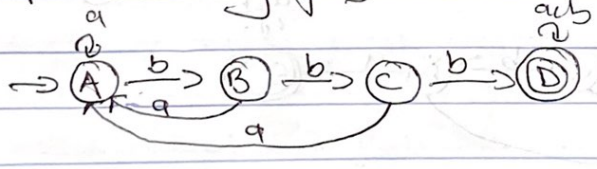
$f$ is a set of states of $Q$

32) DFA that accepts set of strings over $\{a, b\}$ such that

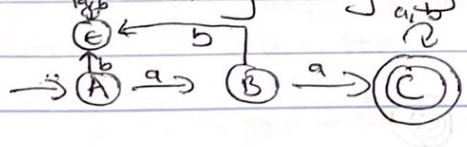
i) Length of the string is 3



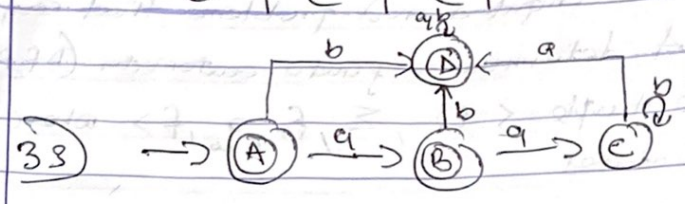

ii) Accepts sub-string of 3 consecutive b's




iii) Accepts strings begining with aa



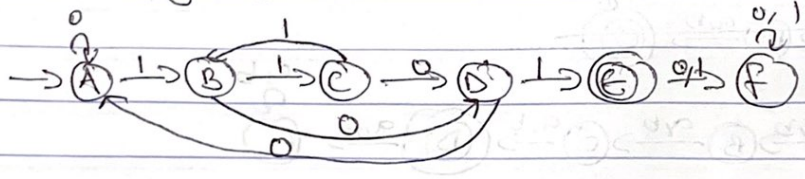
| | | |
|---|---|---|
| B | B | C |
| C | C | C |



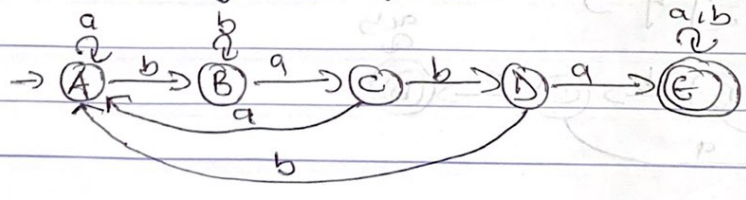

33)

| | a | b |
|---|---|---|
| A | B | D |
| B | C | D |
| C | D | C |

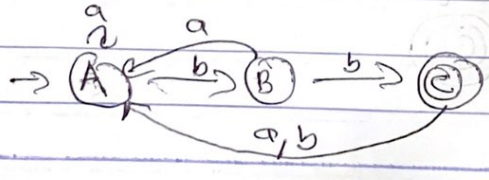
34) DFA that accepts a language over all strings {0,1} that end in 101

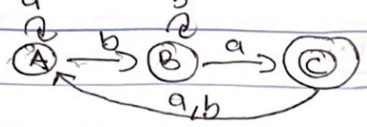



11) all strings {a,b} that contains the string baba




35) DFA accepting the language of strings over {a,b} ending with bb

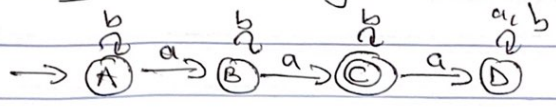




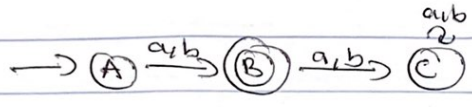

| | a | b |
|---|---|---|
| A | A | B |
| B | C | B |
| C | A | A |

37) DFA for all set of strings over {a, b} such that

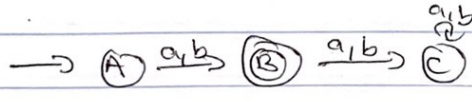
i) The string contains only 2a's



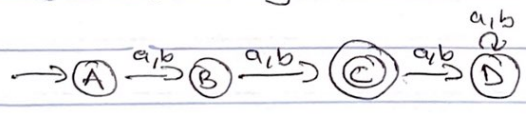

ii) $w \in \{a,b\} \mid |w| = 1 \bmod 3$




iii) $w \in \{a,b\} \mid |w| = 1 \bmod 2$

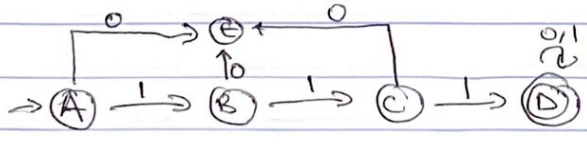



iv) Length of string is at most 2

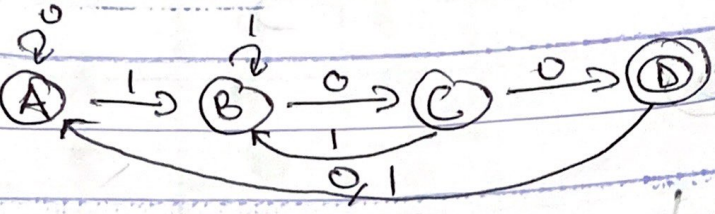



38) DFA that accepts a language over all string {0,1}

i) That begins with 111



That ends with 100




That contains 101