

Assignment

1) A finite automata is the simplest form of computation, it has very limited memory. It is an abstract machine that can be in exactly one of a finite number of states at a time.

2) A deterministic finite automata (DFA) is represented formally by a 5-tuple i.e $\{\Sigma, Q, \Sigma, q_0, f\}$ where:

Q = set of all states

Σ = inputs

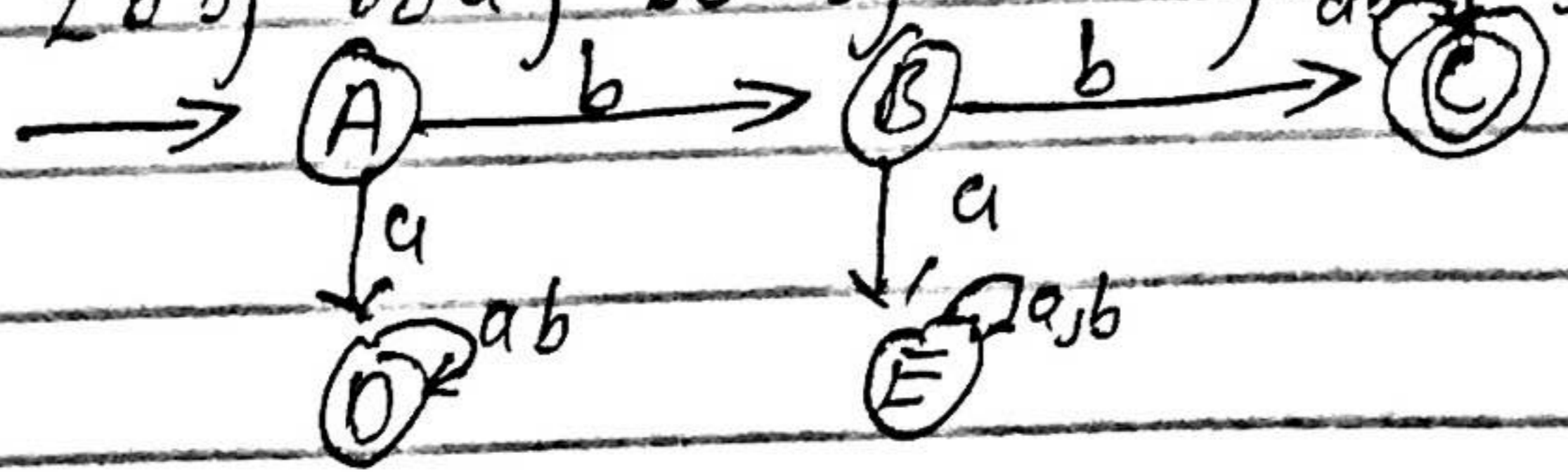
q_0 = initial state

f = set of final states

δ = transition function.

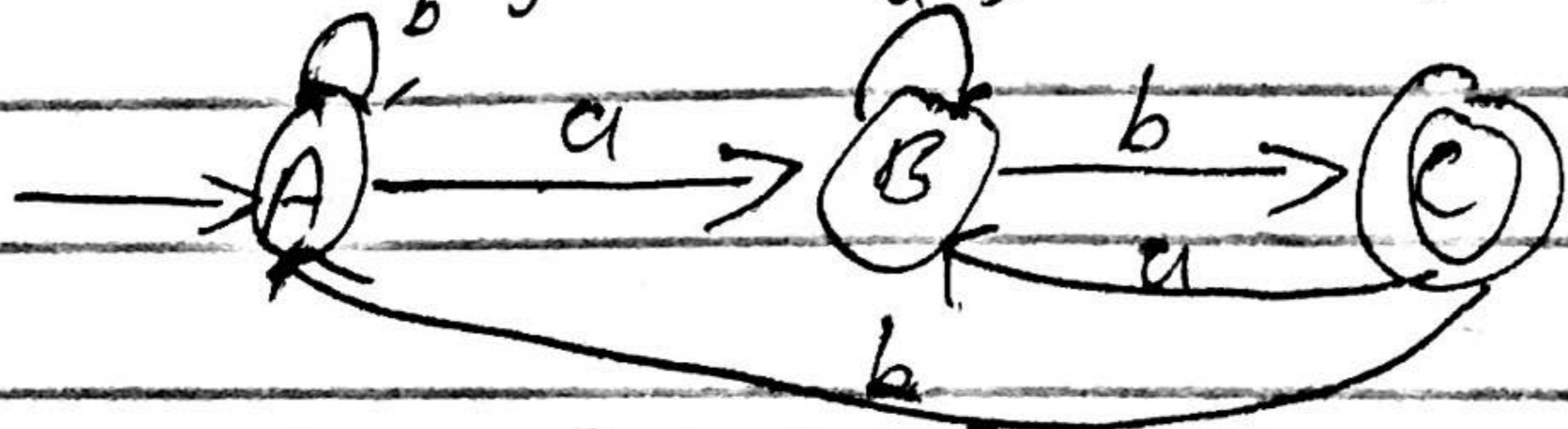
2) $L =$ set of all strings starting with bb

$L = \{bb, bba, bbab, bbba, \dots\}$



3) $L =$ set of all strings ending with ab

i.e $\{ab, aab, bab, bbaab, \dots\}$



$Q = \{A, B, C\}$

$\Sigma = \{a, b\}$

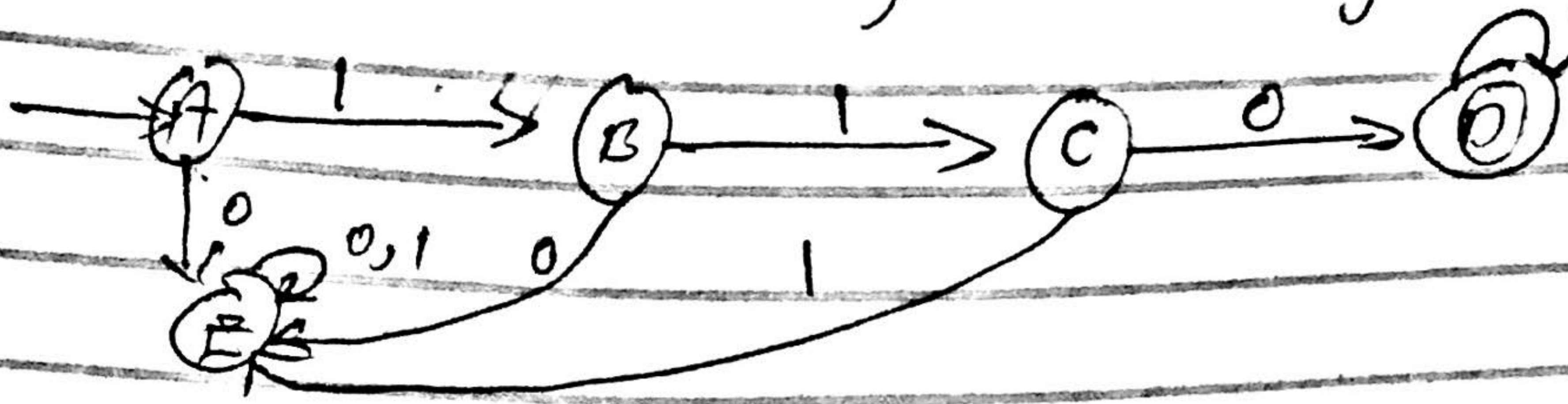
$q_0 = A$

$f = C$

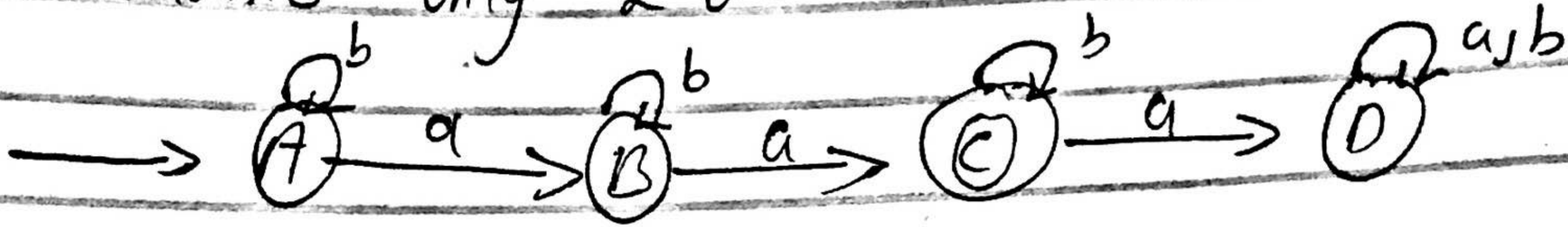
$\delta =$

	a	b
A	B	A
B	B	C
C	B	A

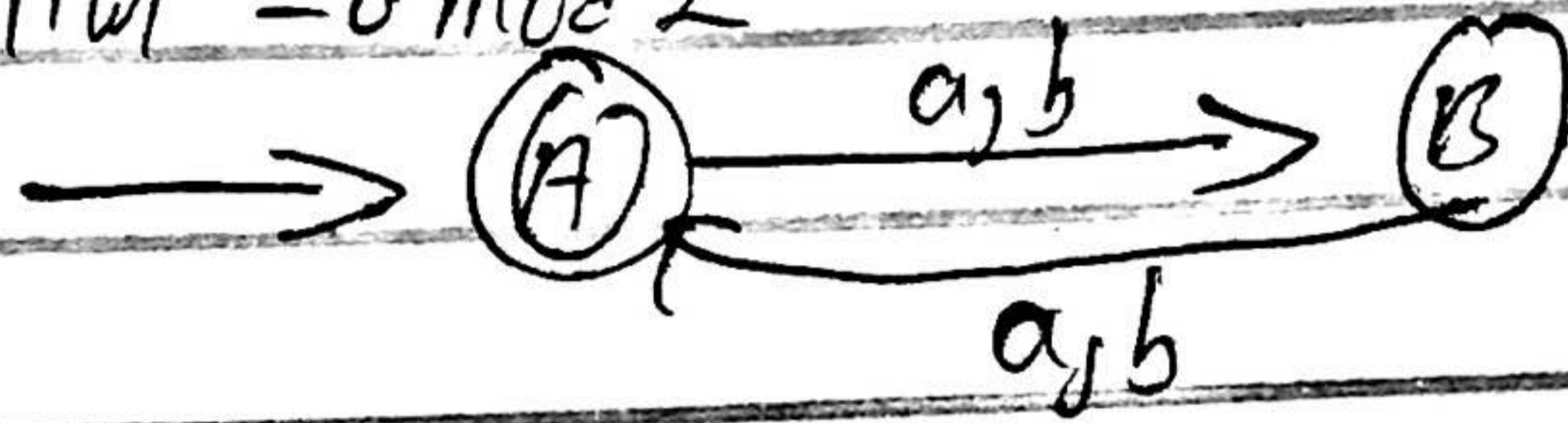
4) $L =$ set of all strings that begin with 110



5) i) $L =$ set of all strings over $\{a, b\}$ that the string contains only 2 a's



ii) $L =$ set of all strings over $\{a, b\}$ that $w \in \{a, b\}^*$ $|w| \equiv 0 \pmod{2}$



iii) $L =$ set of all strings over $\{a, b\}$ that $w \in \{a, b\}^*$ $|w| \equiv 2 \pmod{3}$.

