

NAME = Hamid

ID = 14105

DATE = 24/6/2020

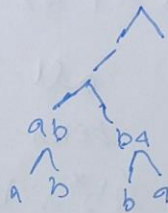
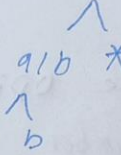
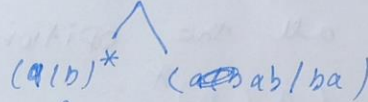
Programm = ~~10~~ BS (CS)

Q1:- Ans:-

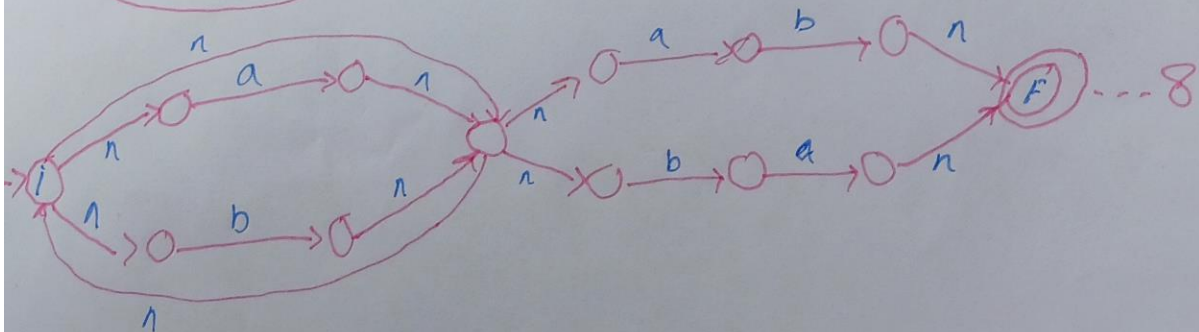
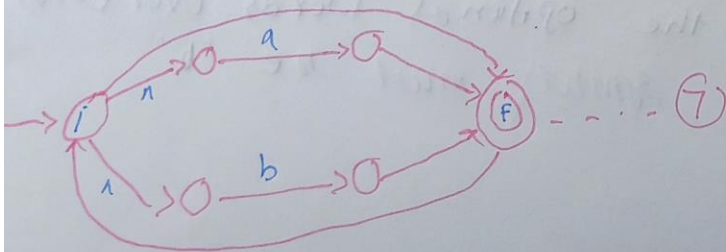
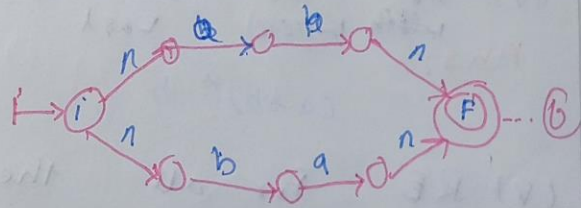
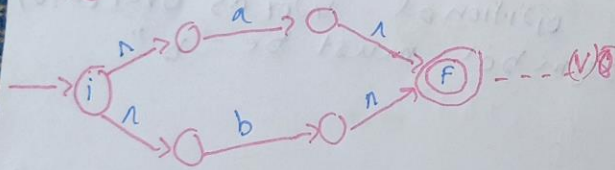
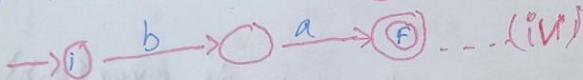
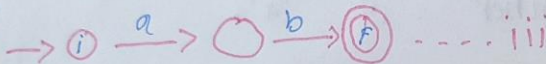
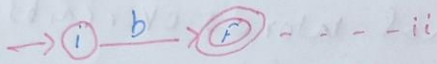
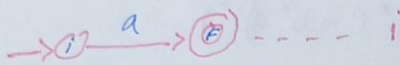
$(a/b)^*(ab/ba)$

Parsing

$(a/b)^*(ab/ba)$



Atomic Symbols: a b



~~Q2: Ans:-~~

Q2: Ans:-

Design RE For the following.

(i) RE for all the optional words over  $\{a, b\}$ .

Ans:-

$$(a/b)^*$$

(ii) RE for all the optional words over  $\{a, b\}$

Ans: with an even number of "a".

$$(b^* a b^* a b^*) \text{ OR } b^* (a b^* a b^*)^*$$

(iii) RE for all the optional words over  $\{a, b\}$

Ans: with an odd number of "a".

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

(iv) RE for all the optional words over  $\{a, b\}$  where last symbol must be "b".

Ans:

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

(v) RE for all the optional words over  $\{a, b\}$

Ans: where first symbol must be "b".

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



Q3: Ans:-

A) Prove that  $(a/b)^* \neq a^*b^*$

$$\begin{array}{l} (a/b)^* \\ (a/b)^0 = 1 \\ (a/b)^1 = a \text{ or } b, a, b \\ (a/b)^2 = \{aa, ab, ba, bb\} \\ (a/b)^* = \{1, a, b, aa, ab, \dots\} \end{array} \quad \neq \quad \begin{array}{l} a^*b^* \\ a^0b^0 = 1 \\ a^1b^0 = a \\ a^0b^1 = b \\ a^*b^* = \{1, a, ab, b, ba, \dots\} \end{array}$$

it proves that  $(a/b)^* \neq a^*b^*$

B)

i.  $(a/b)(a/b)b(a/b)^*$

Ans:- All the words over  $\{a, b\}$  which starts with "aa" or "ab" or "ba" or "bb" followed by b and ends with any letter.

ii.  $(a/b)^*b(a/b)(a/b)$

Ans:-  $L = \{a, b\}$  where string starts with any letter followed by b and ends with "aa" or "ab" or "ba" or "bb"

iii.  $(a/b)^*(aa/bb)$

Ans:- All the words over  $\{a, b\}$  having at least 2 a's and 2 b's at the end.

iv.  $(aa/bb)(a/b)^*$

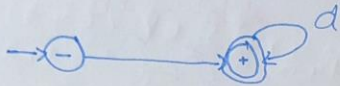
Ans:- All the words over  $\{a, b\}$  having at least 2 a's or 2 b's at the beginning.

Q4 : Ans:

Constructing

an ~~an~~ NFA

(i).  $(+|-) d^+$



(ii).  $(a/b)^* (aaa/bbb) (a/b)^*$

