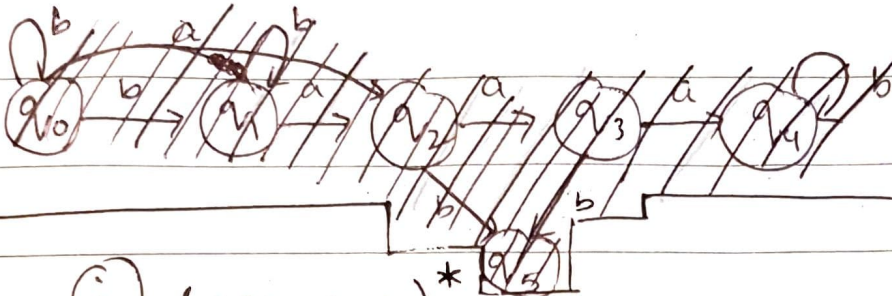


Practice Questions #01 ToA

Q1

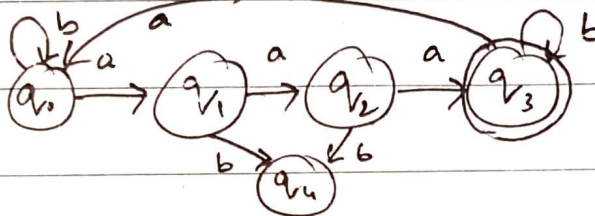
$$((aaa)^* + b^*)^*$$

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



bbb ✓
 bba
 bab aaa X
 ↑

(i) $(aaa + b)^*$

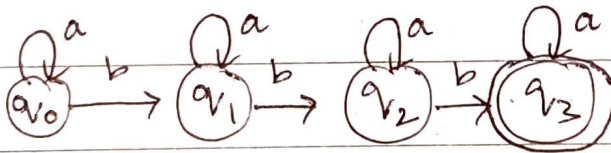


a

ii

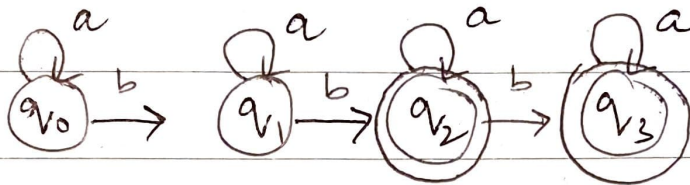
$$a^* b a^* b a^* b a^*$$

bbb



iii

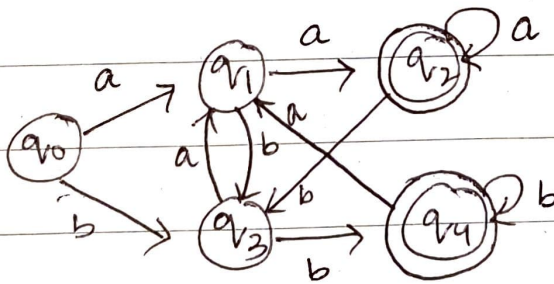
$$a^* b a^* b a^* + a^* b a^* b a^* b a^*$$



iv

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

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



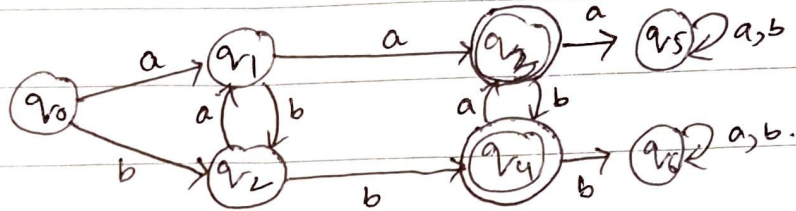
aaaa
 bbbb
 babaa

v

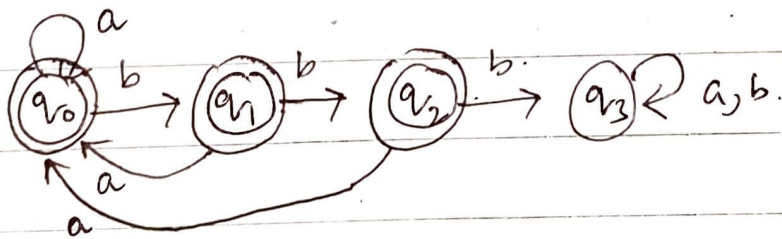
$$b^*aa b^* + a^*bba^*$$

bababab
babab aa babab

$$(b+\lambda)(ab)^*aa(ba)^*(b+\lambda) + (a+\lambda)(ba)^*bb(ab)^*(a+\lambda)$$



$$vii) (\lambda + b + bb)(a + ab + abb)^*$$

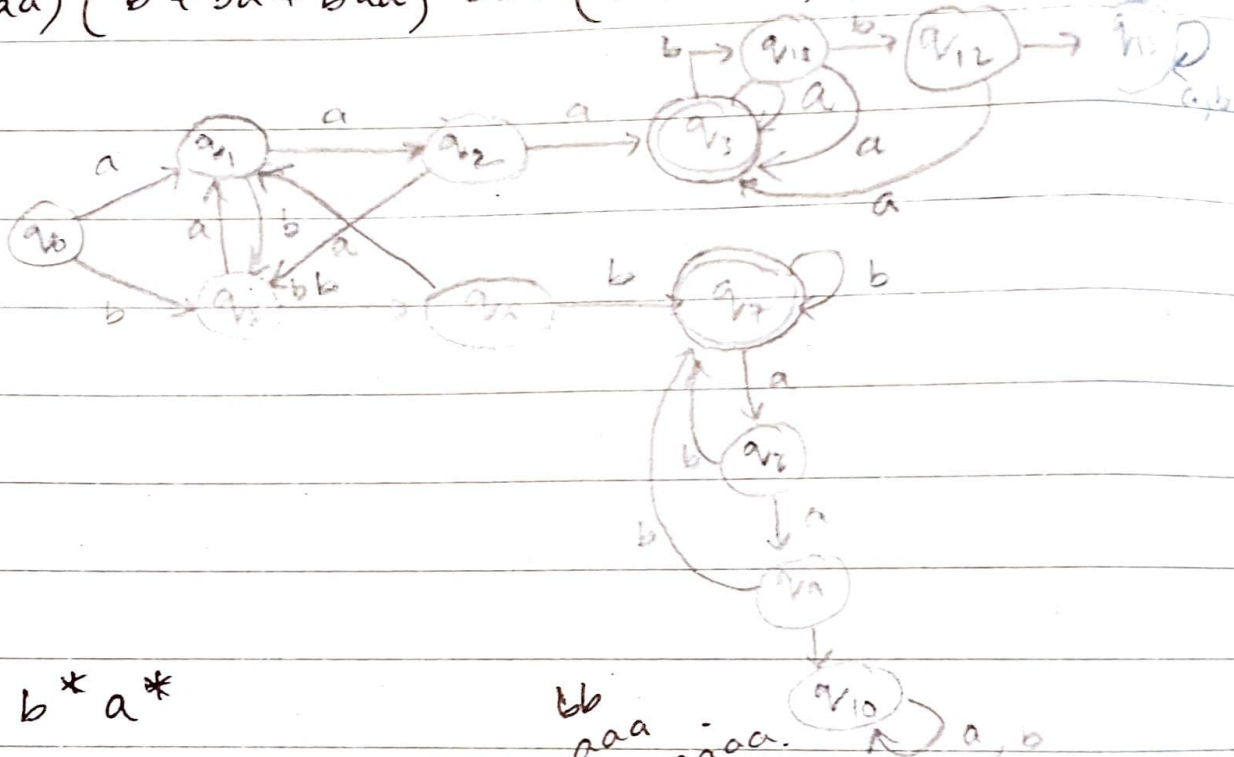


a
abb.
babb.
bba
bbabb.
bbkabb. X

vii)

$$(\lambda + b + bb)(a + ab + abb)^* aaa (\lambda + b + bb)(a + ab + abb)^* +$$

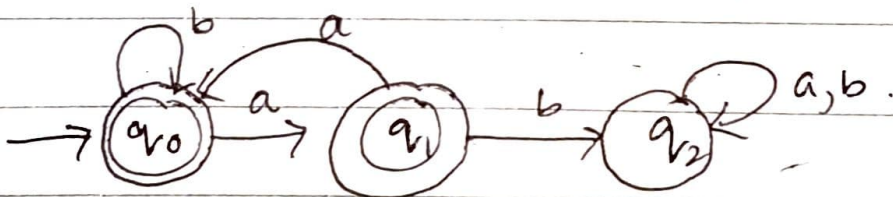
$$(\lambda + a + aa)(b + ba + baa)^* bbb (\lambda + a + aa)(b + ba + baa)^*$$



viii)

$$b^* a^*$$

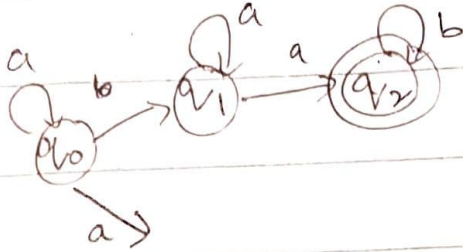
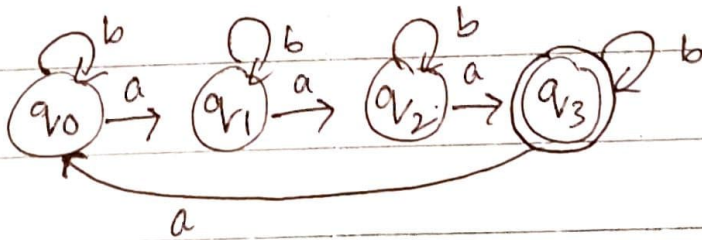
bb
aaa
bbbaaaaa.
a, b



(ix)

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

both bba abb X
abba X
bbaabb X.

(x) $(b^*ab^*ab^*ab^*)^*$ 

13

Q2.

(i) $(ab)^*a$

$a(ba)^*$

$a, aba, ababa, \dots = a, aba, ababa, \dots$

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

$(a+b)^*$

$aab, aaabbb$

$aab, aaabbb$

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

$(a+b)^*$

$ab, aaabbb$

$ab, aaabbb$

(iv) ϵ^* ϵ

ϵ ϵ

(v) $(a^*b)^*a^*$ $a^*(ba^*)^*$

$aba, aabaa$

$aba, aabaa$

(vi) $(a^*bbb)^*a^*$

$a^*(bbba^*)^*$

$\rightarrow a bbb aa$

$\rightarrow a bbb aa$

(vii) $((a+bb)^*aa)^*$

$\epsilon + (a+bb)^*aa$

$abbaa$

$abbaa$

viii

$$(aa)^*(\epsilon + a)$$

$$a^*$$

$$aaa$$

$$a$$

ix

$$a(aa)^*(\epsilon + a)$$

$$a^*$$