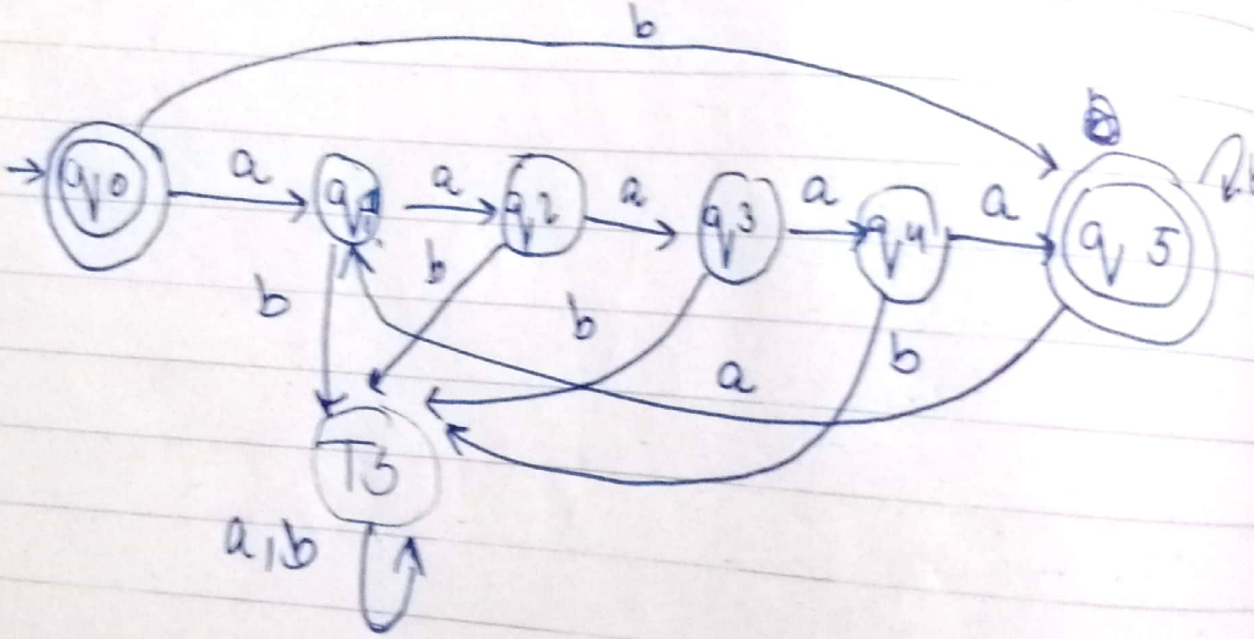
TOA
Assignment 1
21K-3153

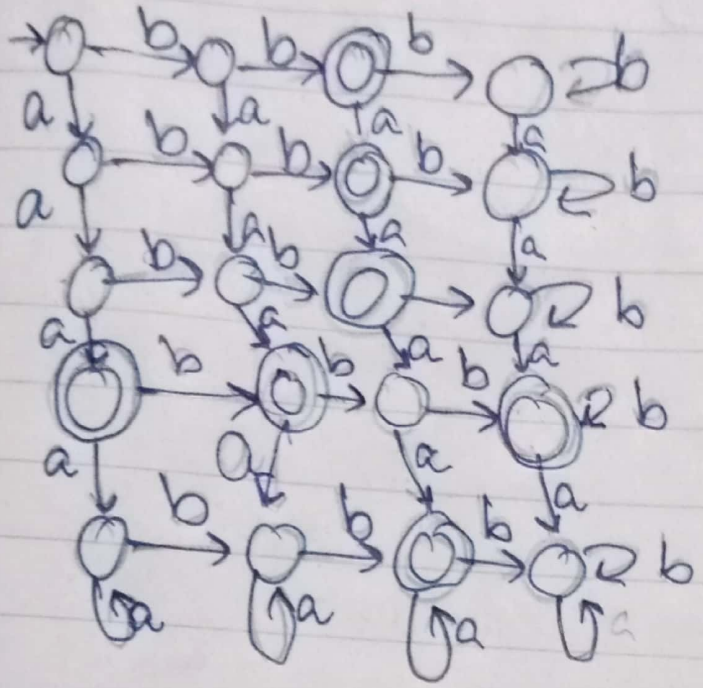
(Q1) (a) $P = \{a, b\}$

$(aaaaa + b)^*$

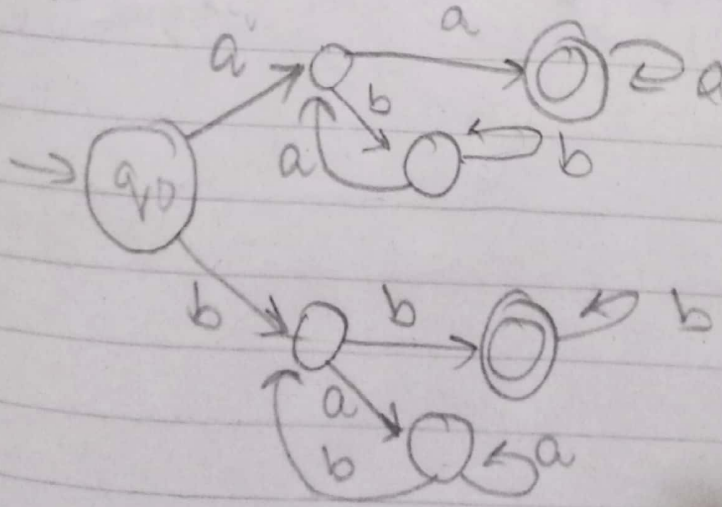


(ii) Exactly 2 b's or exactly 3 a's

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

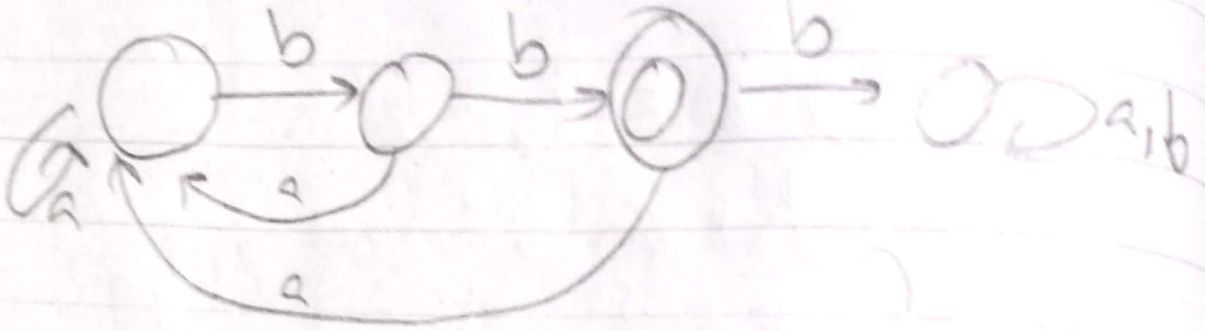


(iii) $(aa+bb)(a+b)^* + (a+b)^*(aa+bb)$

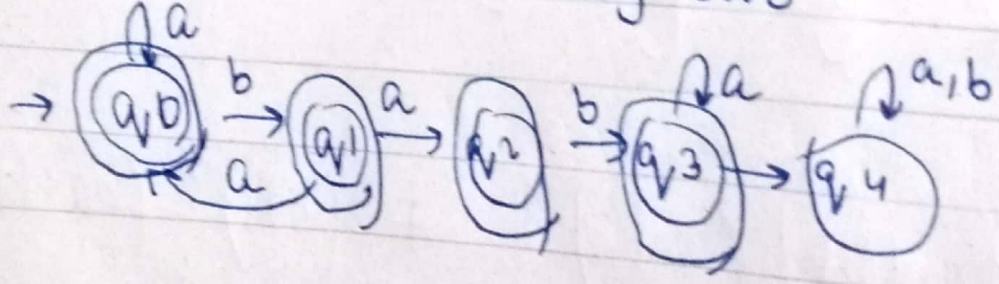


bbaaaabb

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



(v) do not have substring bab



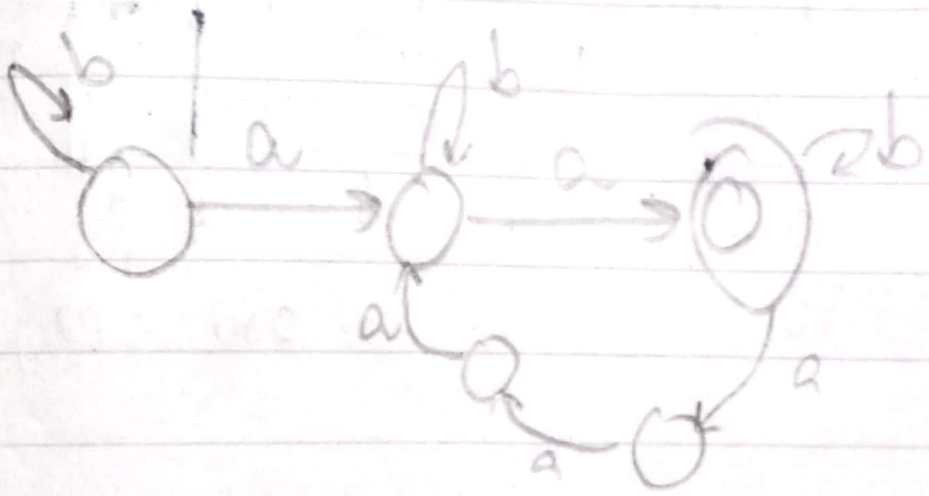
$(a + ab)^* b^*$

158

(vi) a's ~~[illegible]~~ mod 3 = 2

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

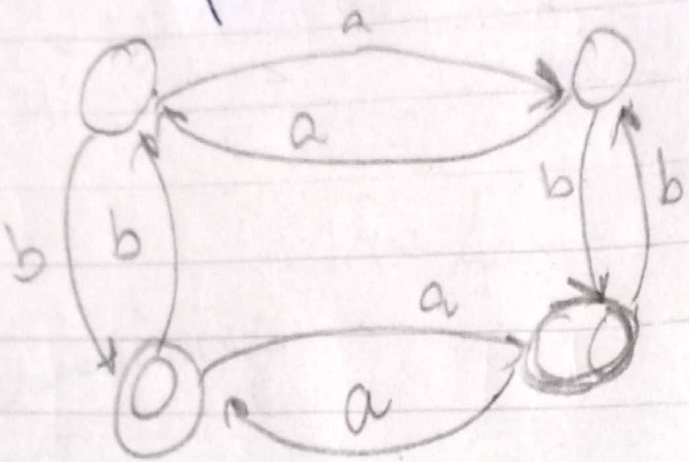
$$(b^* a b^* a b^*) \cdot (b^* a b^* a b^* a b^*)^*$$



TOA
assignment continuation

(viii) even a's Odd b's

$$((ab+ba)(aa+bb)^*(ab+ba)) ((ab+ba)(aa+bb)^*(ab+ba))^* b.$$



(Q1) Hous# A-307, Sector 11-B, North Kar

1- [A-Z][a-z]+ # (A-307), [A-Z][a-z]+ (11

North Karachi

2-

[A-Z][a-z]+ (89) / [A-Z][a-z]+ (123) /
[A-Z][a-z]+ (234) / (Apt#18) / Askari4

abababab
ababababab

(Q2) $\Sigma = \{a, \ldots, z\}$

from a-z in small letter

a) either comp or imp

$[a-z]^* \cdot (\text{comp} + \text{imp}) \cdot [a-z]^*$

b) ends with "virus"

$\Sigma = [a, \ldots, z]$

$[a-z]^* \cdot \text{virus}$

c) z followed by atleast one o

$[a-z]^* \; z \cdot o^+ \; [a-z]^*$

(Q3) $\Sigma = [a, \ldots, z]$

$([b|c|d|f|g|h|j|k|l|m|n|p|q|r|s|t|v|w|x|y|z] \cdot [\sim\sim a|e|i|o|u])+$

(Q4) $\Sigma = \{A-Z, a-z, 0-9, !@\#\$\%\ldots\}$

$[[!@\#\$\%\wedge\&*]+ \cdot [0-9]+ \cdot [a-z]+ [A-Z]+ \{4,\}]$

(Q5)

IBAN

PK $[0-9][0-9][A-Z]\{4\}[0-9]\{16\}$

OR

$[0-9]\{16\} \cdot [0-9]\{3\}$