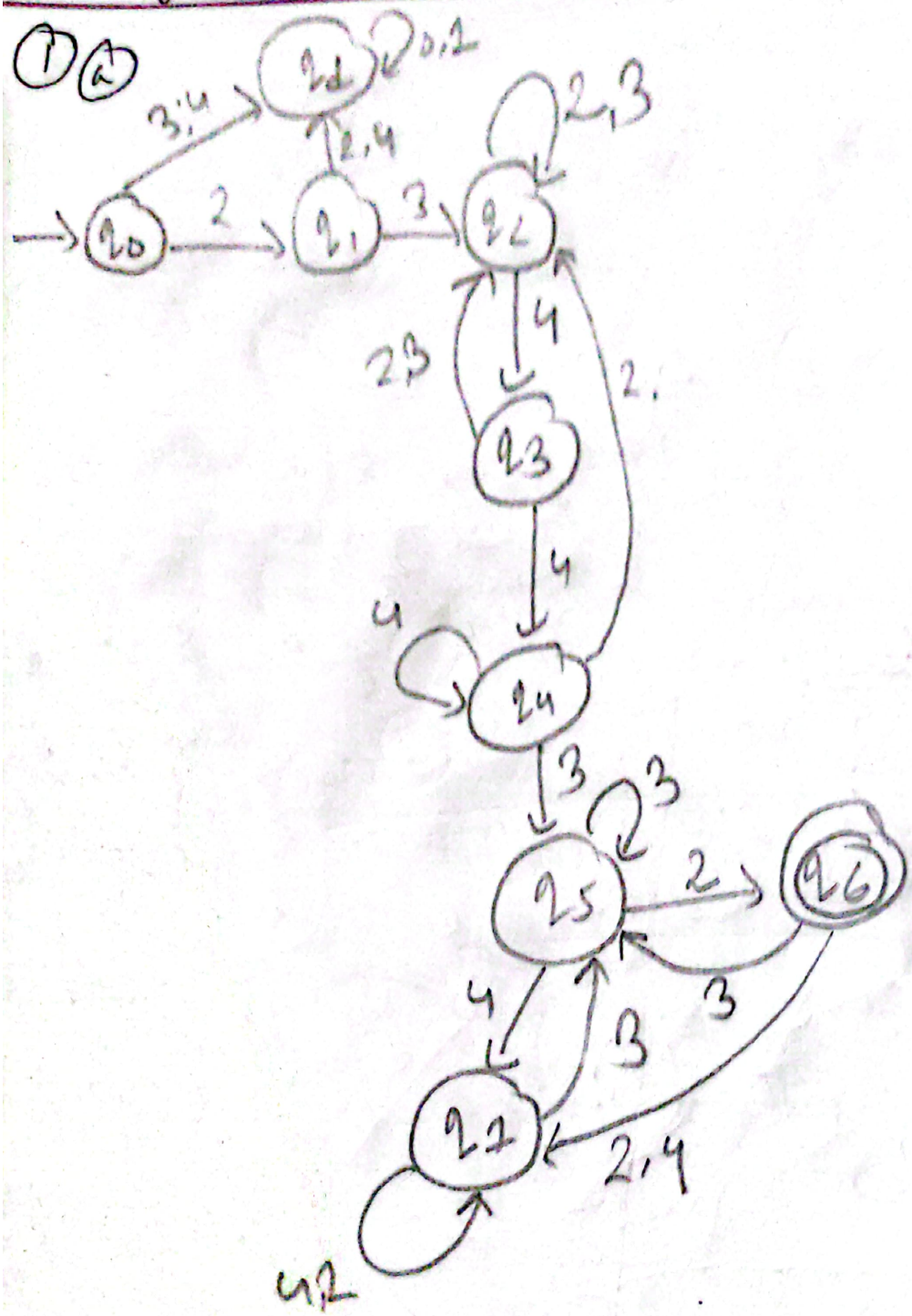
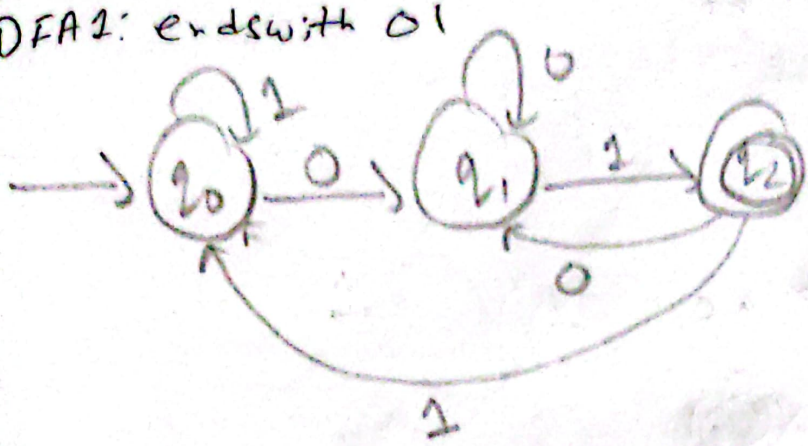
Spring 2024

(1) (a)

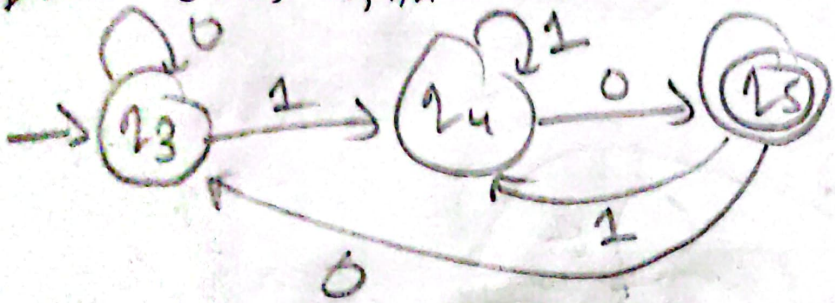


(5)

DFA1: ends with 01

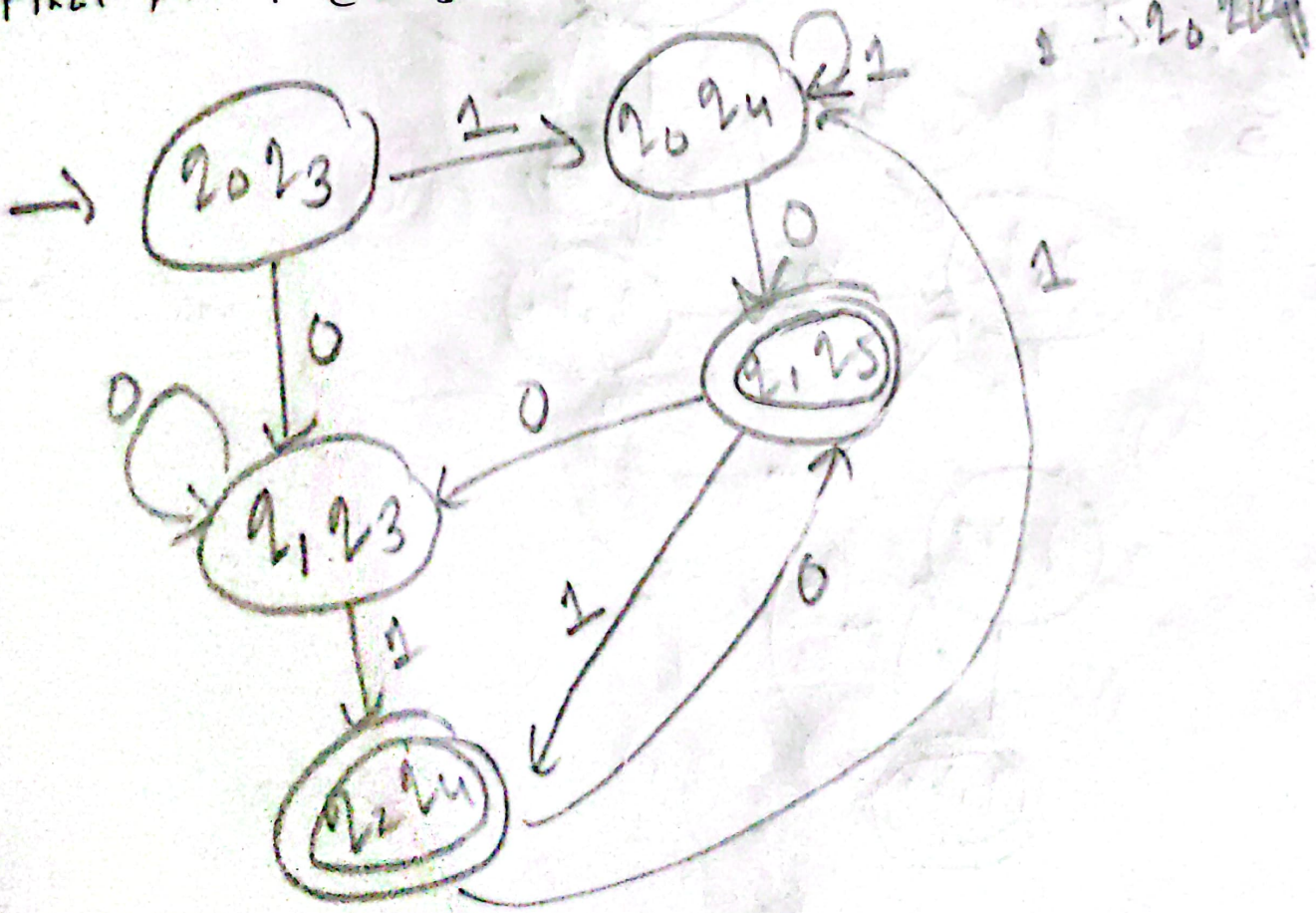


DFA2: ends with 10



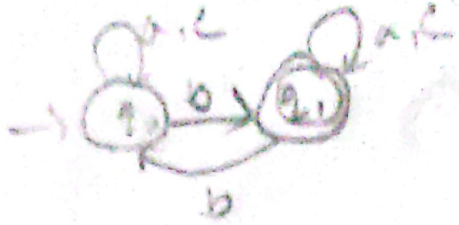
Final DFA: ends with 10 or 01

0 -> q1 q5
1 -> q0 q4



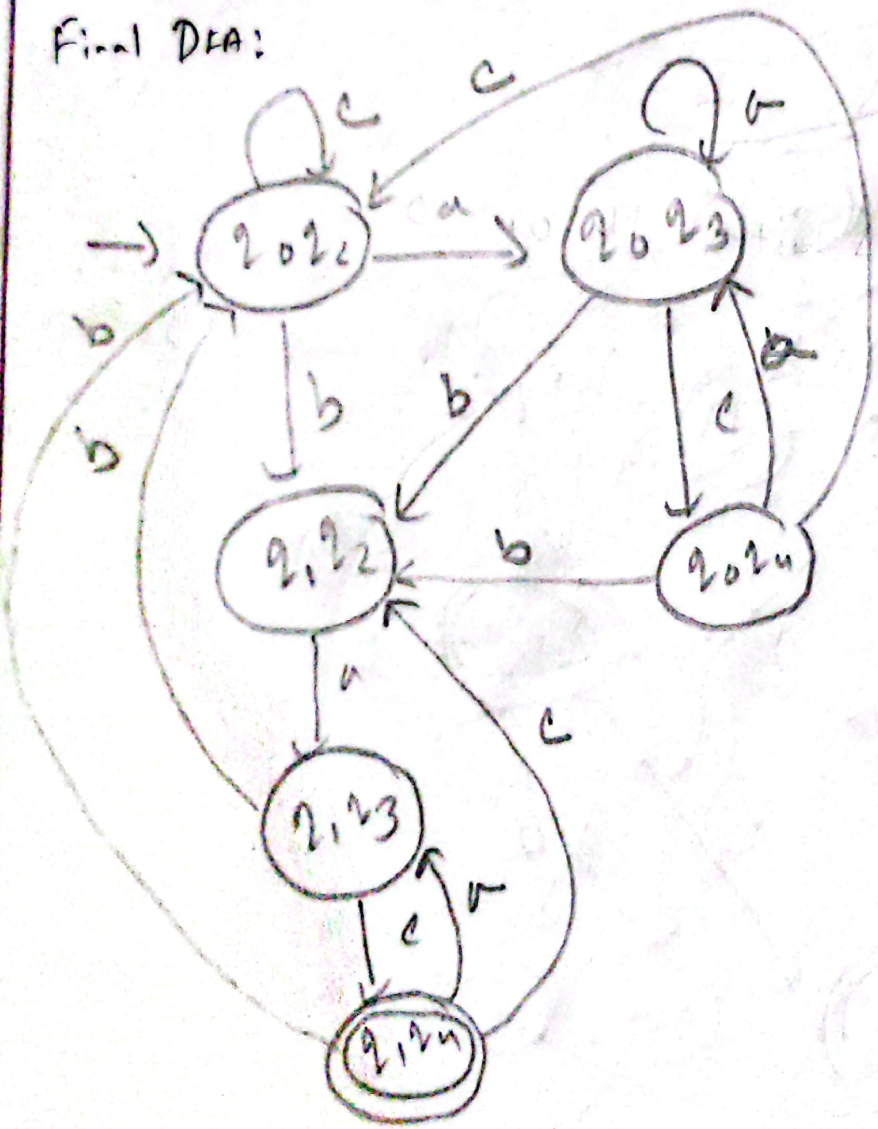
(1)

DFA1: odd number of b's



DFA2: ends with a c

Final DFA:

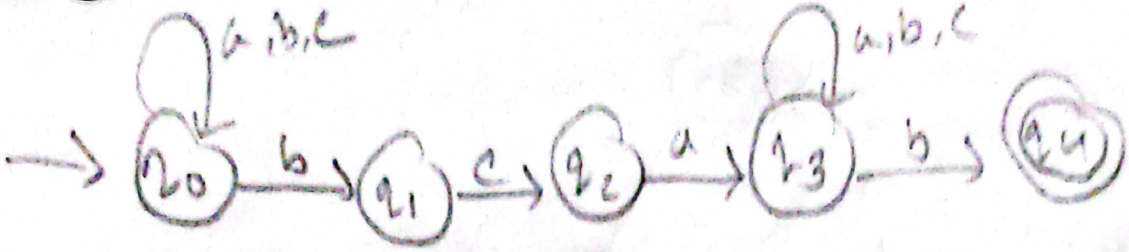


a → q1, q3

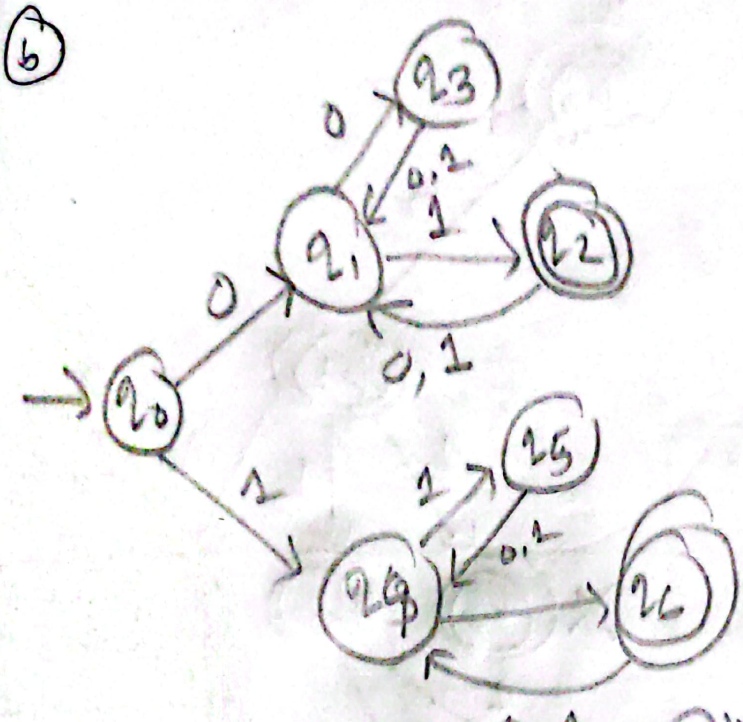
b → q0q2

c → q1q2

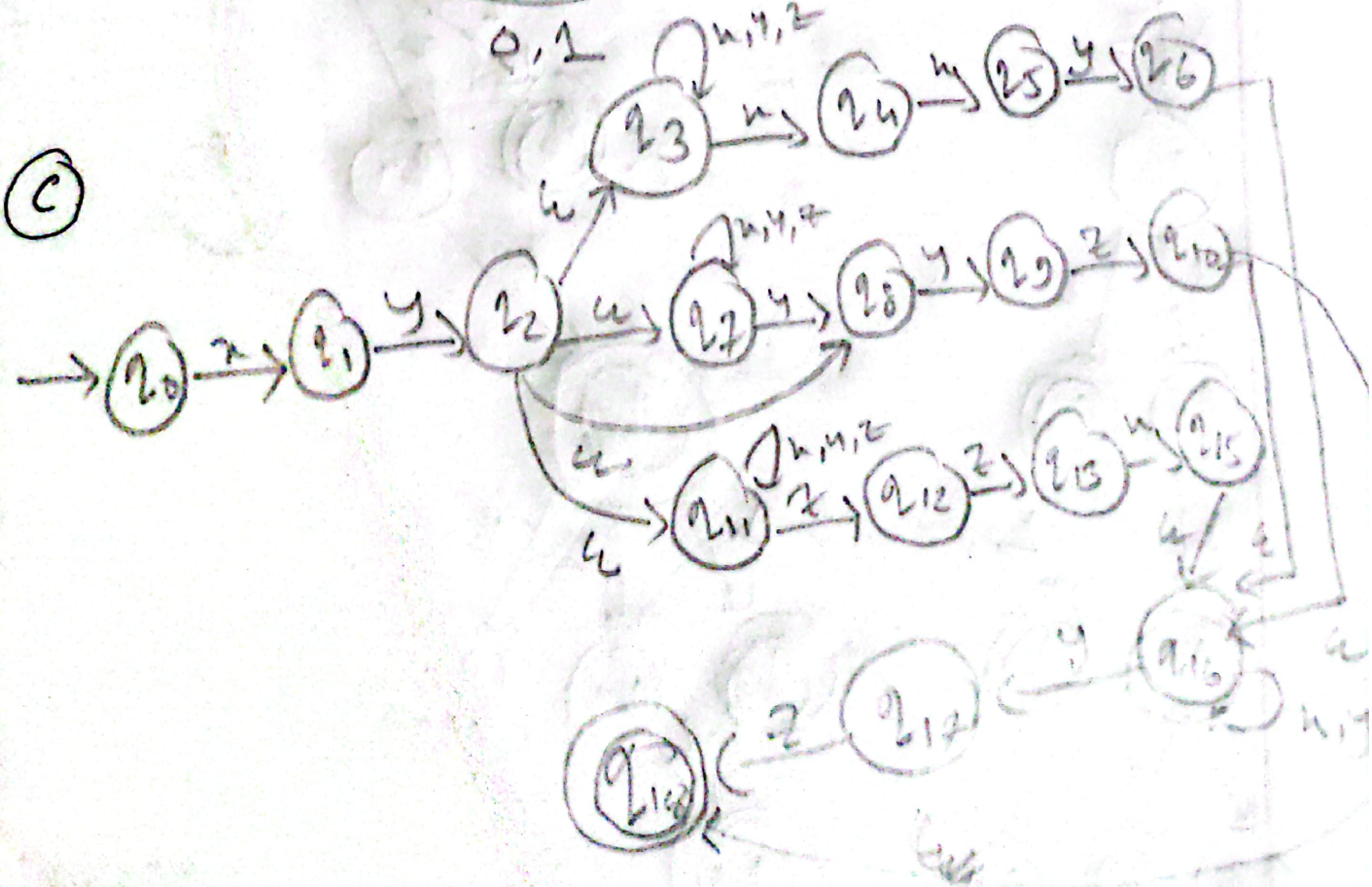
2 (a)


a,b,c
a,b,c
q_0
b
q_1
c
q_2
a
q_3
b
q_4

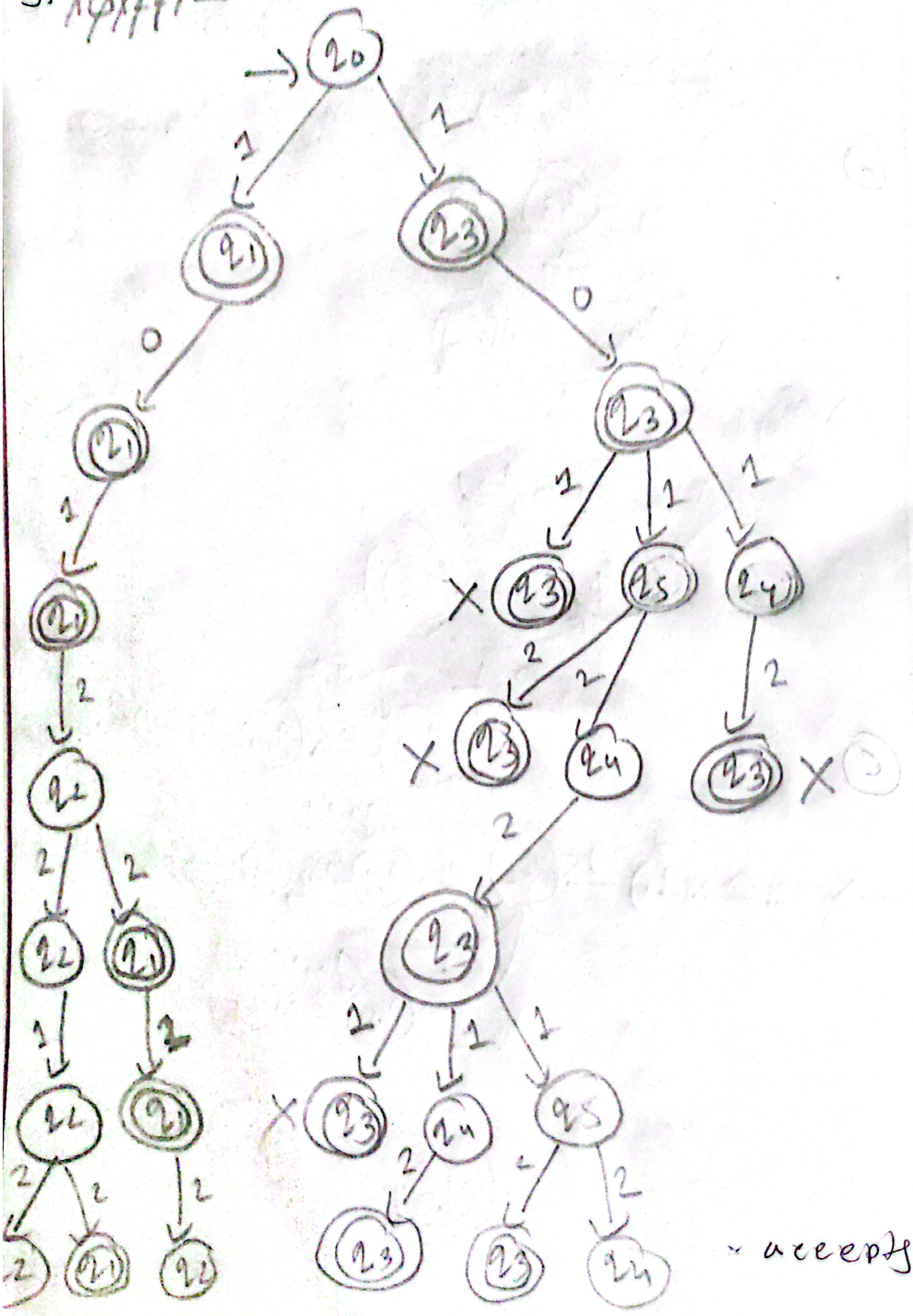
(b)


q_0
0
q_1
0
q_3
0,1
1
q_2
0,1
1
q_5
1
q_4
0,1
q_6
0,1

(c)


q_0
x
q_1
y
q_2
a
q_3
a,y,z
a
q_4
y
q_5
z
q_6
a
q_7
a,y,z
y
q_8
y
q_9
z
q_{10}
a
q_{11}
a,y,z
z
q_{12}
z
q_{13}
y
q_{15}
y
z
q_{16}
y
z
q_{14}
z
q_{17}

3. XOXXXV2



· accept

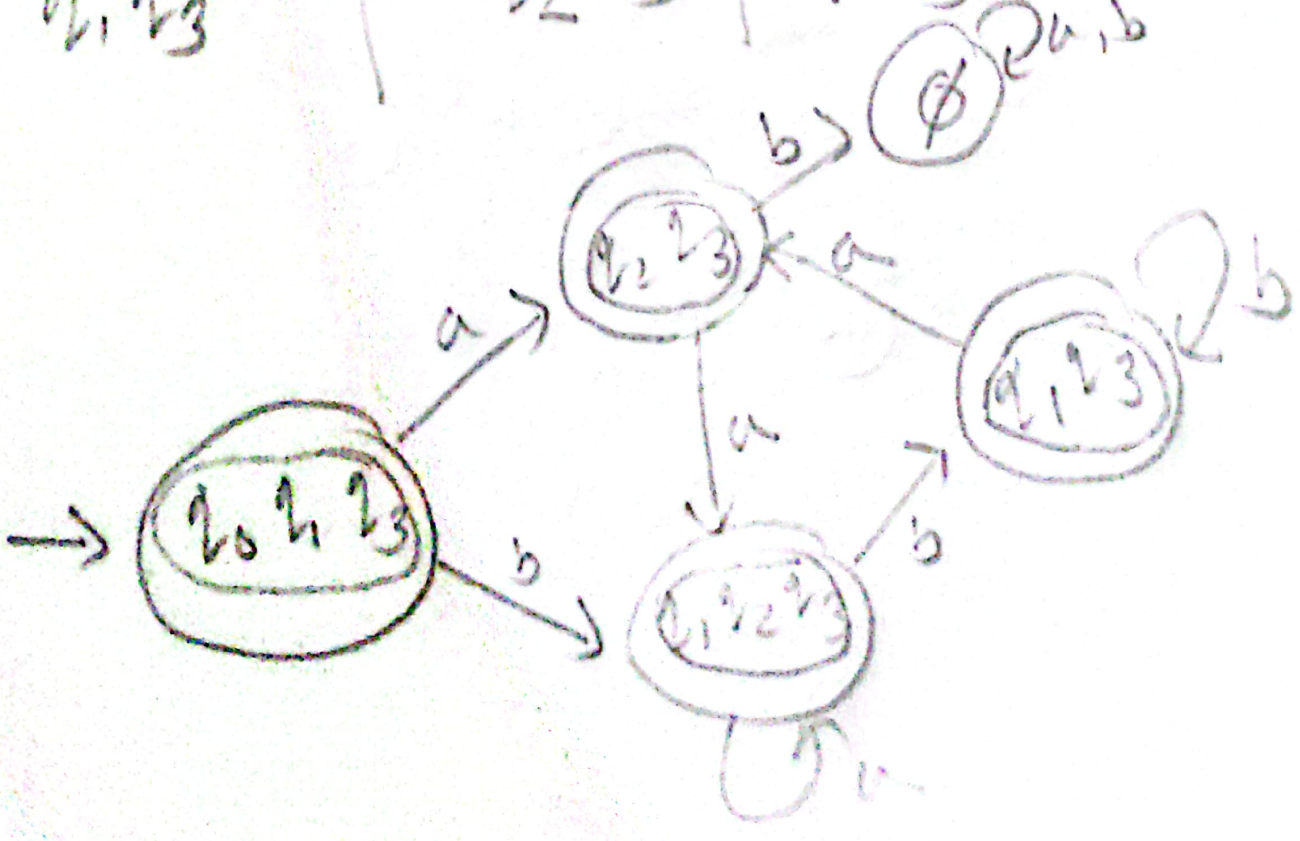
$eclose(q_0) = q_0 q_1 q_3$

$eclose(q_1) = q_1 q_3$

$eclose(q_2) = q_2 q_3$

$eclose(q_3) = q_3$

	a	b
$q_0 q_1 q_3$	$q_2 q_3$	$q_1 q_2 q_3$
$q_2 q_3$	$q_1 q_2 q_3$	$\emptyset$
$q_1 q_2 q_3$	$q_1 q_2 q_3$	$q_1 q_3$
$q_1 q_3$	$q_2 q_3$	$q_1 q_3$



5.

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

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

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