Set – D

1) a) iii)

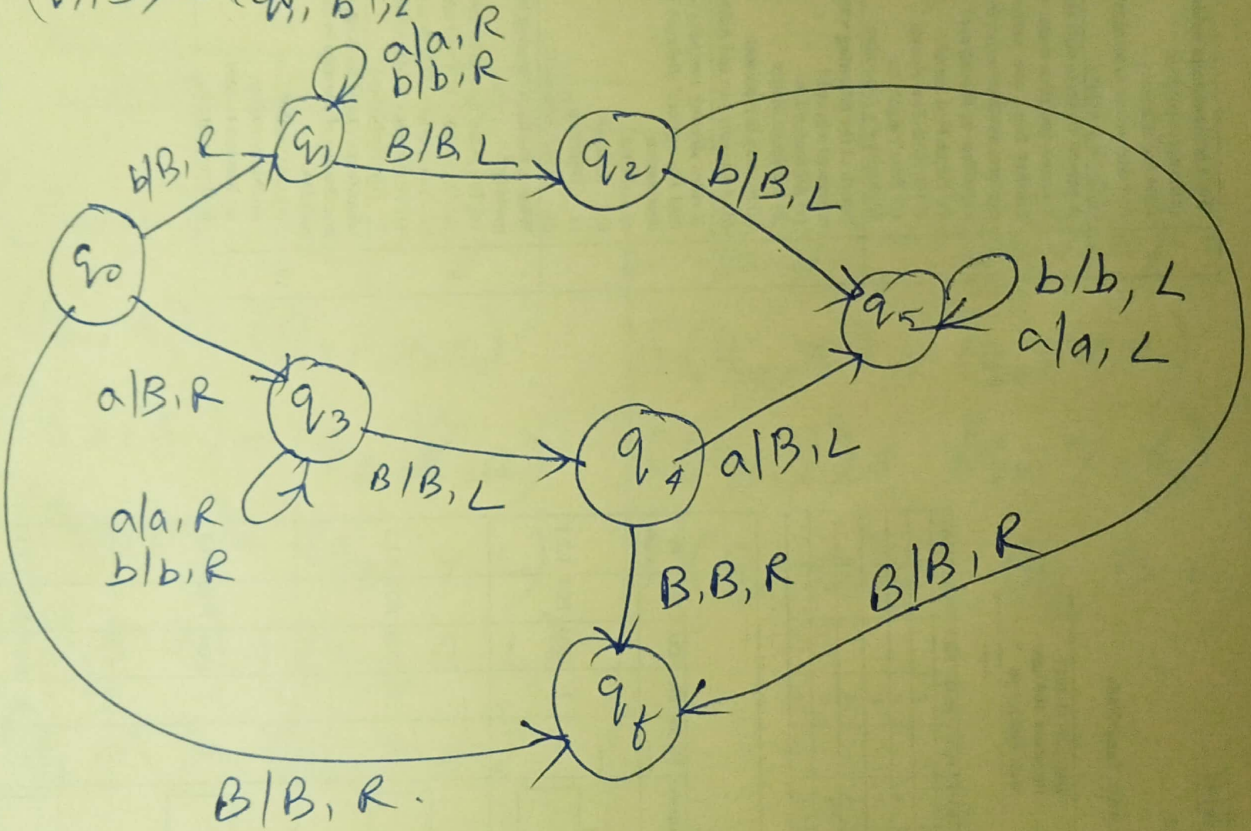
b) ii)

c) $\delta(q_0, a) = (q_1, X, R)$

$\delta(q_1, a) = (q_1, a, R)$

$\delta(q_1, b) = (q_1, b, L)$

d)



e,d) Give rules & table for above diagram

c) $L = \{ w w^R / w \in \{a, b\}^* \}$

f) Acceptor – 1 mk

Justification – 1 mk.

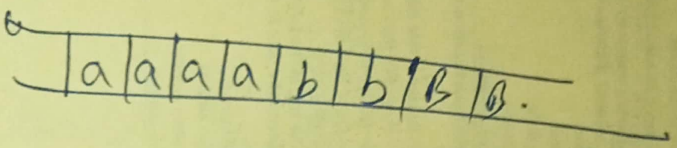
g) $w = aaa$ accepted.

Give the instantaneous description.

2) a) c)

b) d)

c) $L = \{a^{2n} b^n \mid n \geq 1\}$ (10)



$\delta(q_0, a) = (q_1, x, R)$

$\delta(q_1, a) = (q_2, x, R)$

$\delta(q_2, a) = (q_2, a, R)$

$\delta(q_2, b) = (q_3, y, L)$

$\delta(q_3, a) = (q_3, a, L)$

$\delta(q_3, x) = (q_0, x, R)$

$\delta(q_3, y) = (q_3, y, L)$

$\delta(q_0, y) = (q_0, y, R)$

$\delta(q_0, B) = (q_f, B, R)$

d) draw dia (3 ~~4~~ 4 mks)

Table (3)

e) Encode. (6 mks)

Make assumptions like.

$q_0 = 0$, $a = 00$, $q_1 = 000$, $x = 0000$, $R = 00000$

rule ① 0|00|000|0000|00000|1.....

3) a) iv)

b) iv)

(3)

c) (a)

$\delta(q_0, 1) = (q_0, 1, R)$

$\delta(q_0, 0) = (q_0, 0, R)$

$\delta(q_0, B) = (q_f, B, R)$

d) Draw table (2 mks)

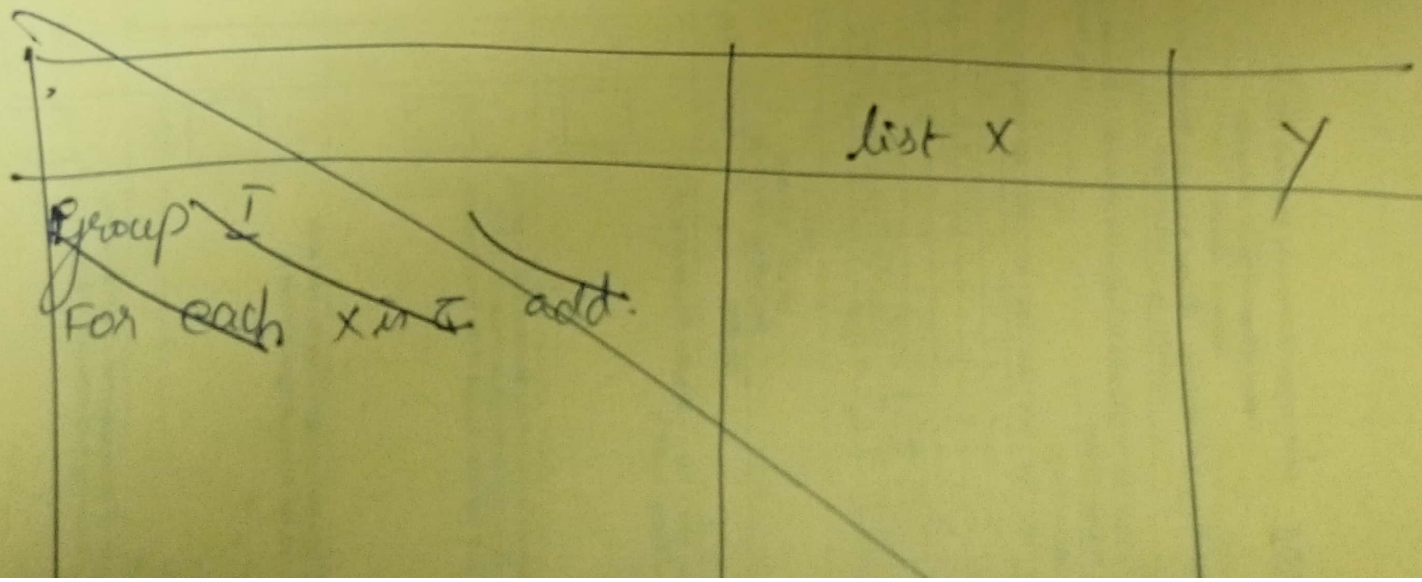
Draw dia (2 mks)

e) a = 1011B

after instaneous description

a = 1011k

f)



3) f)

	X	Y
Basic string	#	# q_0 1011 #
Group I		
	0	0
	1	1
	#	#
Group II		
For each		
$(q_0, 1) = (q_0, 1, R)$	$q_0 1$	$1 q_0$
$(q_0, 0) = (q_0, 0, R)$	$q_0 0$	$0 q_0$
$\delta(q_0, B) = (q_f, k, R)$	$q_0 \#$	$k q_f \#$
Group III		
	$0 q_f 0$	$\# q_f$
	$1 q_f 1$	q_f
	$1 q_f 0$	q_f
	$0 q_f 1$	q_f
	$0 q_f$	q_f
	$1 q_f$	q_f
	$q_f 0$	q_f
	$q_f 1$	q_f
Group IV	$q_f \# \#$	#