Turing machine

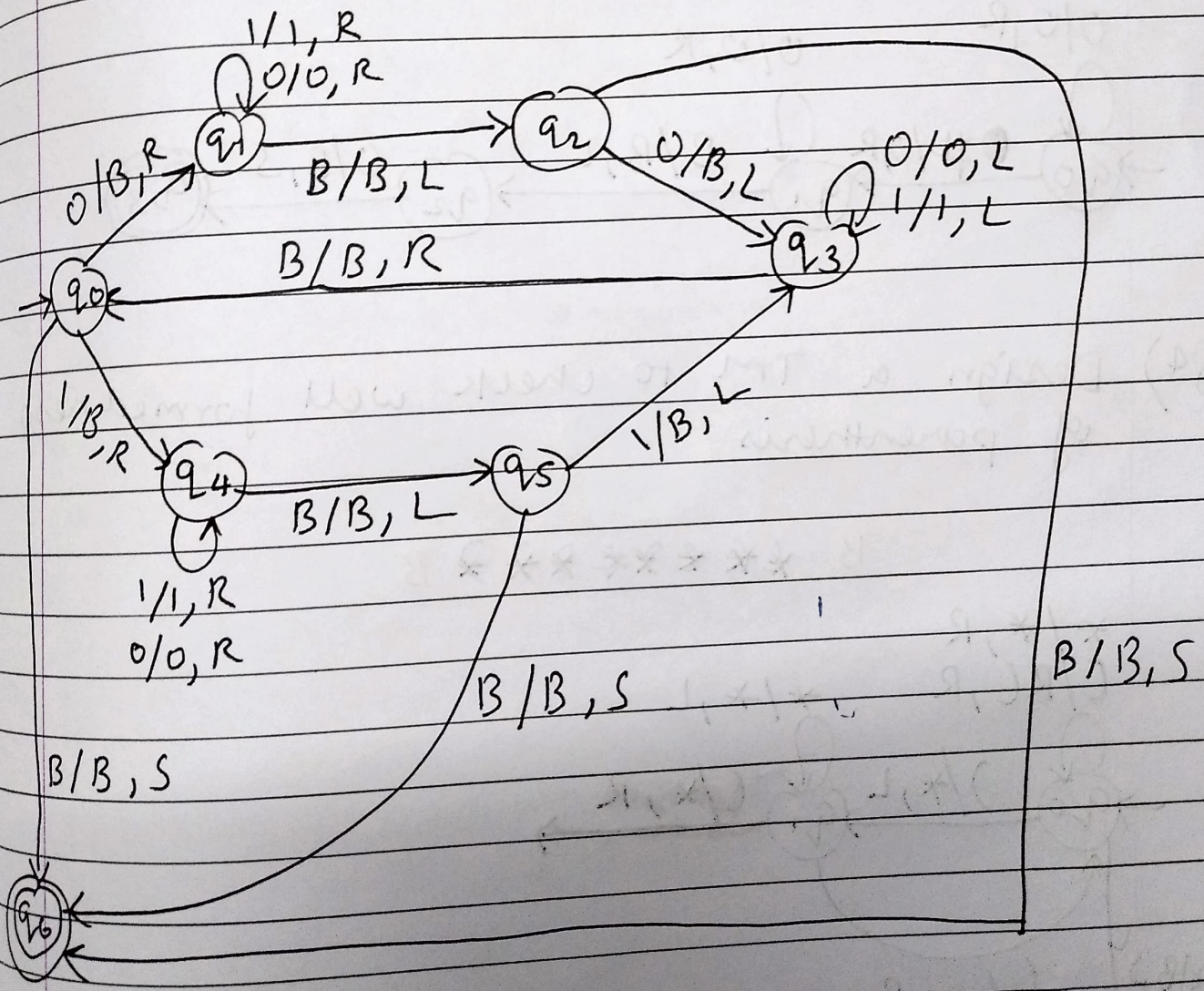
Q) Design a turing machine to accept palindrome over {0, 1}.

=> ww^R [even palindrome]

B B B B B B B B

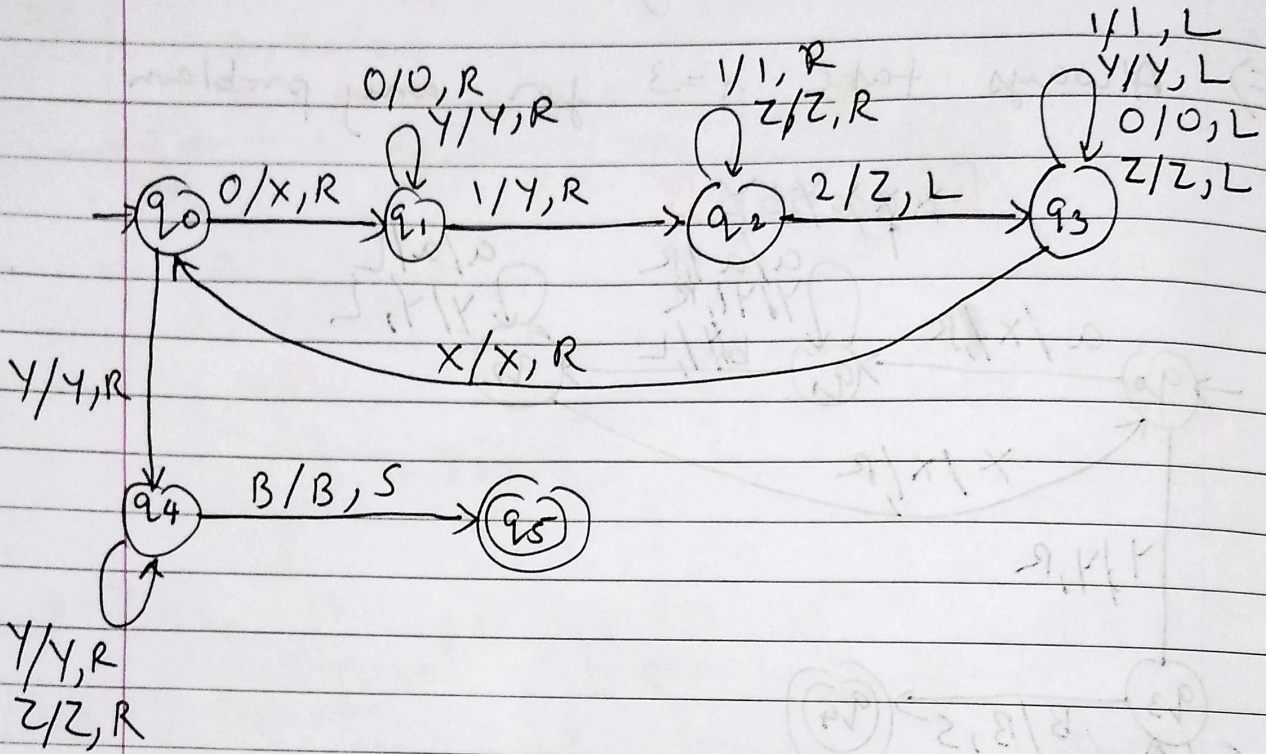
$w0w^R$ [odd palindrome

B B B B B B B B



Q2) $L = \{0^n 1^n 2^n / n \geq 1\}$

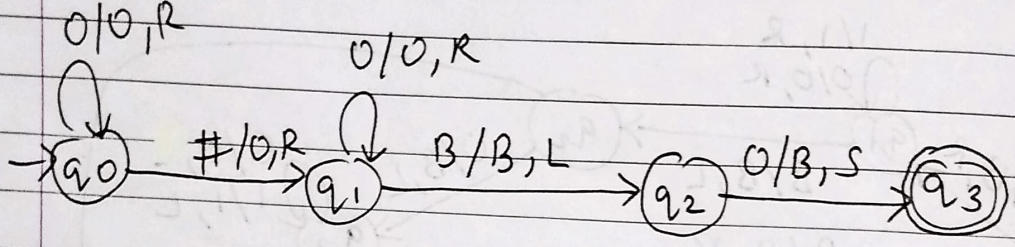
B 0 0 0 1 1 1 2 2 2 B



	0	1	2	X	Y	Z	B
q_0	q_1, X, R	-	-	-	q_4, Y, R	-	-
q_1	-	q_2, Y, R	-	-	q_1, Y, R	-	-
q_2	-	$q_2, 1, R$	q_3, Z, L	-	-	q_2, Z, R	-
q_3	$q_3, 0, L$	$q_3, 1, L$	-	q_0, X, R	q_3, Y, L	q_3, Z, L	-
q_4	-	-	-	-	q_4, Y, R	q_4, Z, R	q_5, B, S
q_5	-	-	-	-	-	-	-

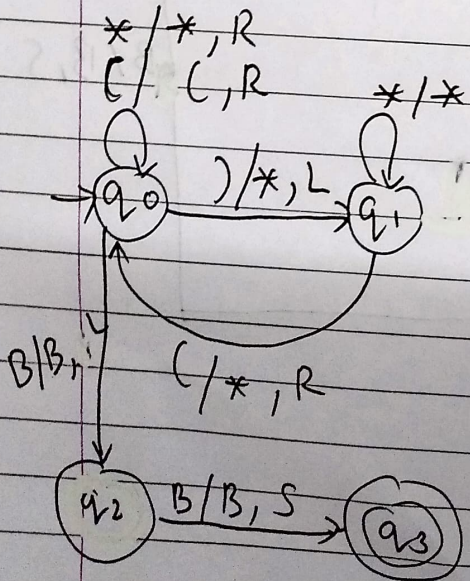
Q3) Design a TM that computes function $f(m,n) = m+n$, the addition of two integers

⇒ B 0 0 0 0 0 # 0 0 0 B B



Q4) Design a TM to check well formedness of parenthesis

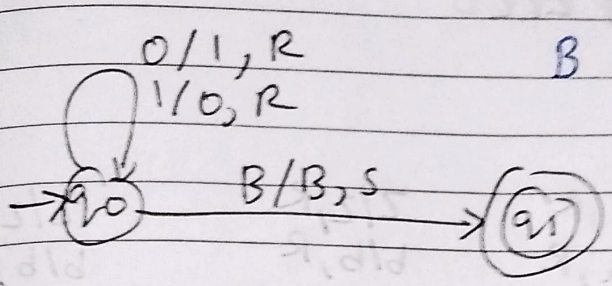
B ((( )) ( )) B



In 1's complement
we exchange 0 with 1
1 with 0

Q5) Design a TM for converting a input binary number to its one's complement of a binary

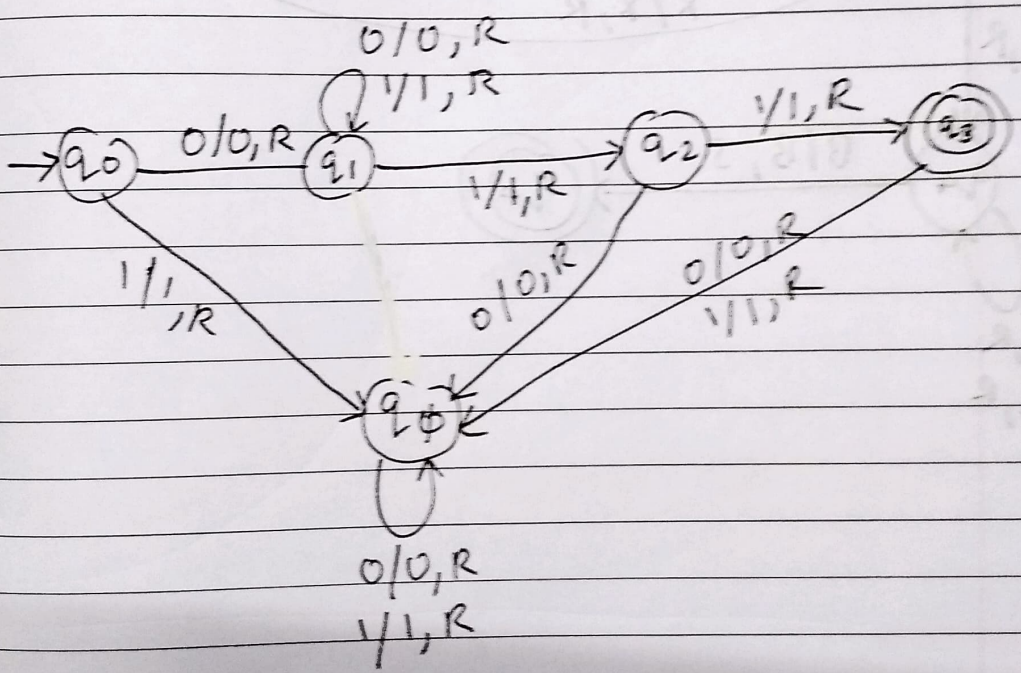
=>



B 0 0 0 0 B

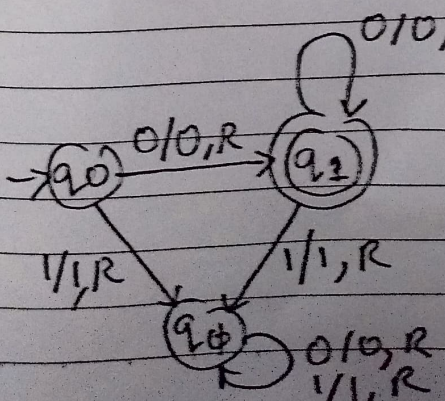
Q6) Design a TM to recognize $r = 0(0+1)^* 11$

=>



Q7) Design a TM to recognize $r = 00^*$

=>



Q8) Design a TM to accept $a^n b^n c^n \mid n \geq 1$

⇒ B X X X Y Y Y Z Z Z B