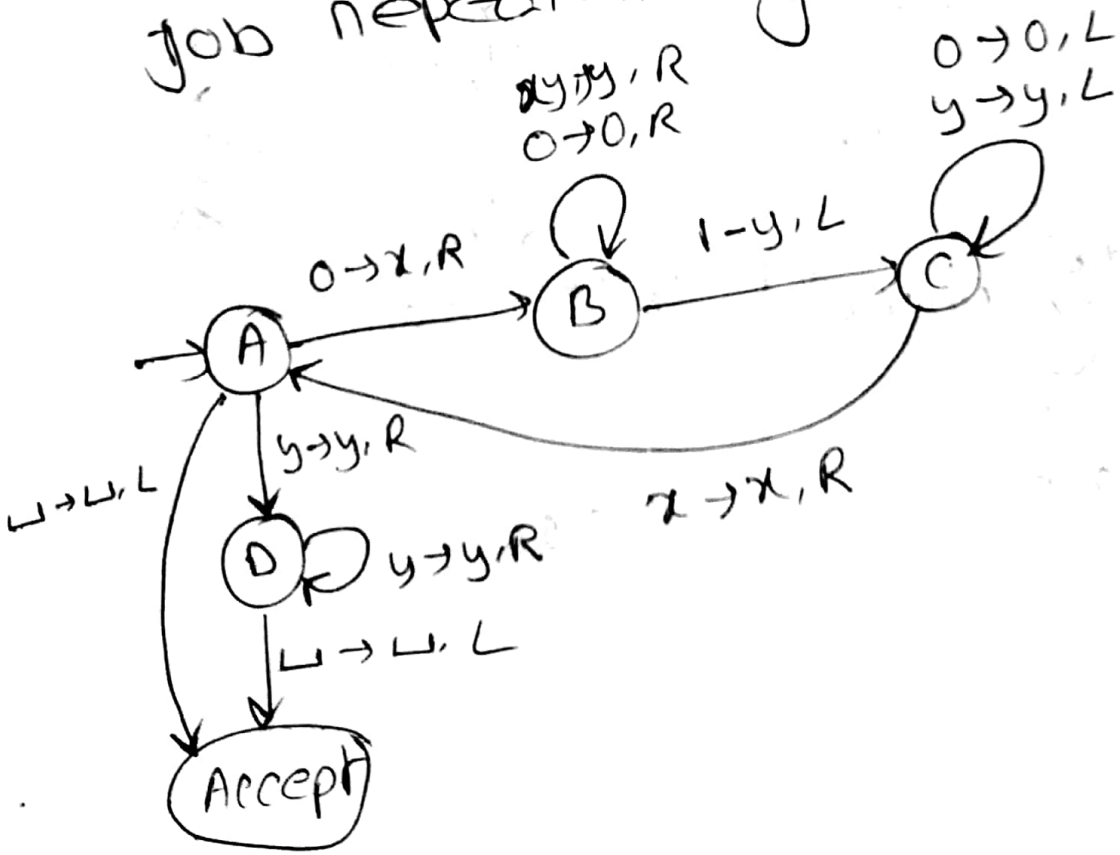
Turing Machine

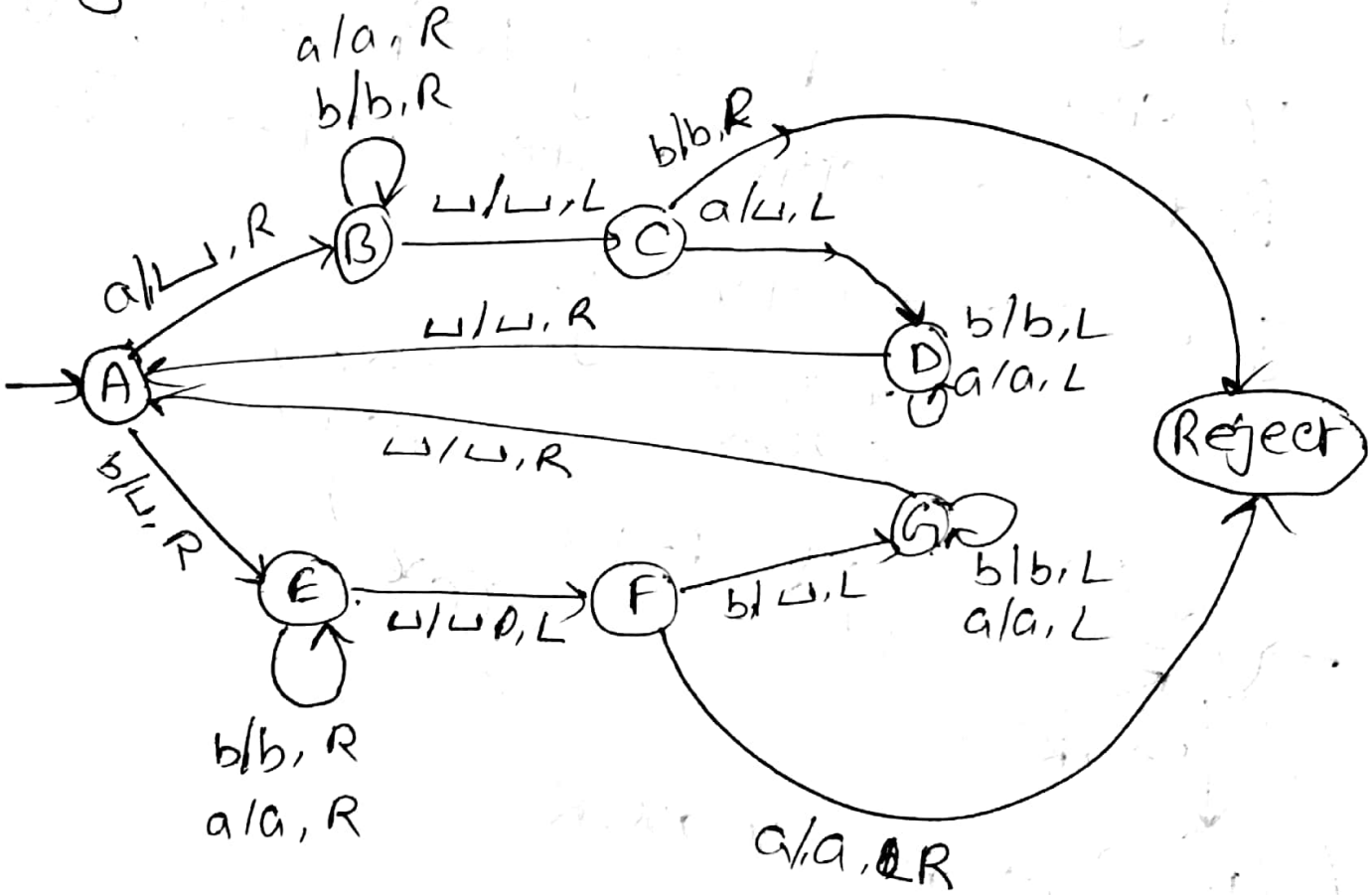
① $L = 0^N 1^N$

If you find a 0, replace it with x. Then go right until you a 1. If you find a 1, replace it with y and start going left until you find the leftmost ~~RHS~~ 0. Then do the job repeatedly.



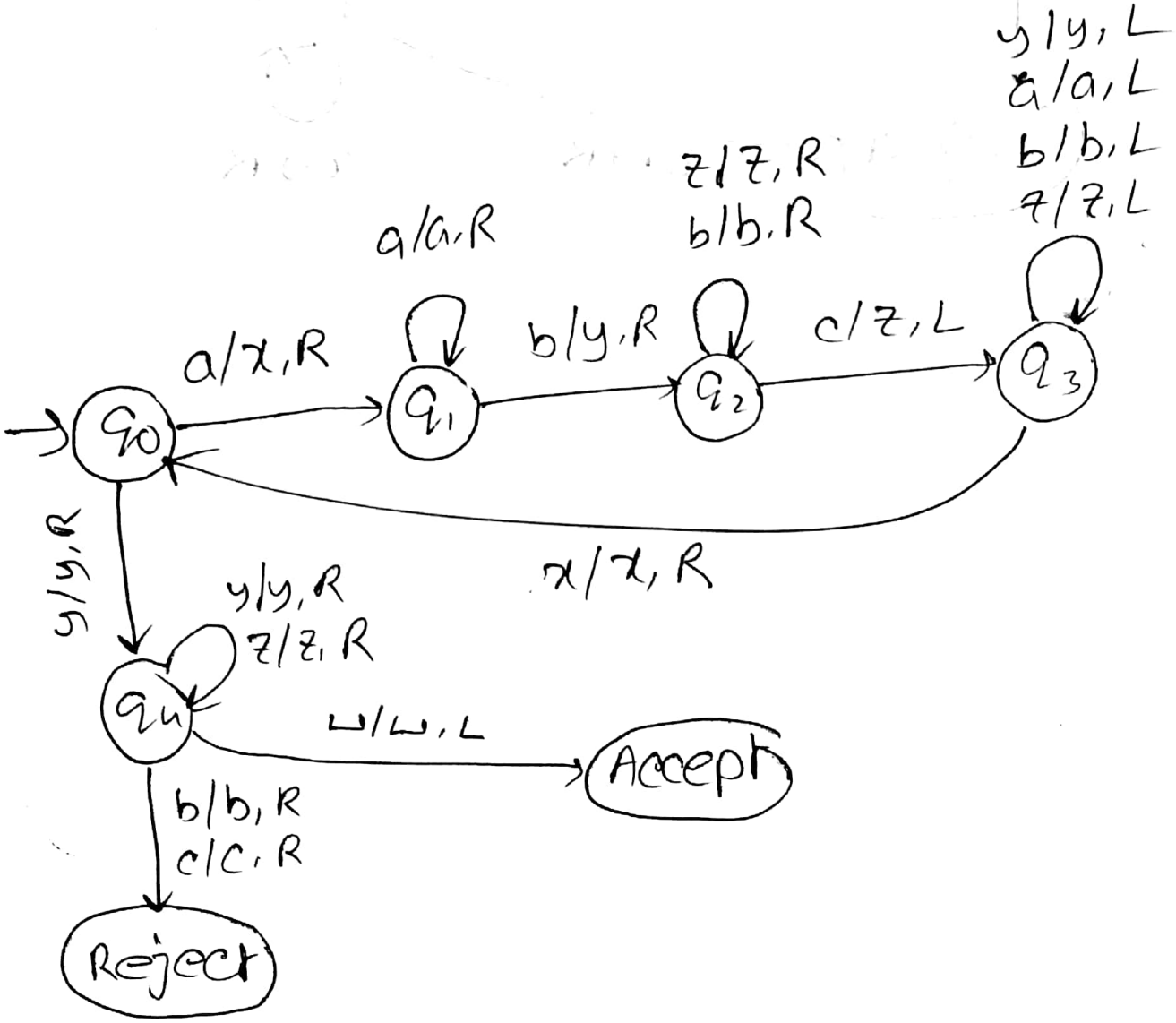
(2) Even palindrome $\Sigma = \{a, b\}$

We know, the 1st and last symbol of a palindrome is always same. So, we make the 1st and last symbol ␣. And thus we repeat



③ $a^n b^n c^n$

we will cancel out 1st a, 1st b and 1st c in every interations. when we will get all a's are completed, then we will check if any b or c is left. If yes, then reject, else accept.



(4) $0^{2^n} \mid n \geq 0$