Q.1) a) Convert the following CFG to Chomsky normal form (CNF):
   \[ S \rightarrow S+S \mid S*S \mid S/S \mid (S) \mid 6 \]

   b) Find a regular expression for all strings that end in a double letter.

Q.2) Draw a Moore machine that can count how many times the substring babb occurs in an input string, then convert it to mealy machine.

   Example: if your input is: baababbaababba then
   the output will be 00000010000010

Q.3) Draw NFA and DFA that accepts the language of all words with "a" as the second letter.

Q.4) a) Find the CFG for the language even-even.

   b) Find regular grammar (RG) for the language \( L = \{ x \in \{a,b\}^* | x \text{ is } aa \text{ followed by at least one set of } bba's \} \).

Q.5) Find Push down automata (PDA) that accepts the language \( L = \{ a^m b^n c^m | m \geq 0, n \geq 1 \} \).

Q.6) Find a Turing machine(TM) that can accepts the language odd palindrome.

Q.7) Let FA1 accepts all words with an odd number of letters, and let FA2 accepts all words with a double "b". Build FA3 that accepts all words with an odd number of letters OR with a double "b", using Kleenes theorem.