PRACTICE SET

1. Design DFA for the following Language over input alphabet (a, b): L = Even no. of a's or Even no. of b's.
2. Design DFA for the following Language over input alphabet(0,1):
3. L = Starting with 01 and end with 10.
4. Design Mealy Machine to convert 2's Complement of the binary input.
5. Design Mealy Machine to convert 1's Complement of the binary input.
6. S –> aSS / aSaS/ aSab | b find left factoring for the given grammar.
7. Find the Derivation of the input string id1+id2*id3
   for the grammar where E□E+E/E*E/id
8. Convert Context Free Grammar to GNF (Greibach normal form).

   S –> CB / AB

   A –> a / AA

   B –> b

   C –> d

9. Write Context Free Grammar for the following languages:

i) L= {a^n b^n | n>=1}

ii) L= {a^m b^n | m=2n, n>=0}

10. Design a PDA, a to accept L = { a^2n b^n | n ≥ 0 }
11. Convert following CFG to CNF:

S → ASB
A → aAS|a|ε
B → SbS|A|bb

12. Construct PDA for L= {w ∈ {a, b} ∗ | #a(w) = #b(w)}, #a(w) represents the number of a's in w
13. Design a PDA, a to accept L = { a^n b^n | n ≥ 1 }
14. Simplify following CFG:

S → ASB

A → aAS|a|ε

B → SbS|A|bb

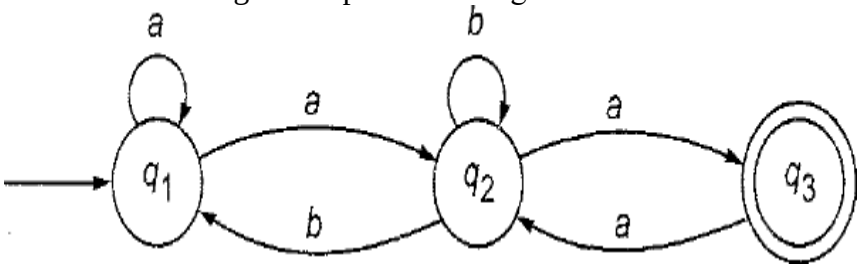
15. Design a PDA, a to accept L = { a^n b^2n | n ≥ 1 }
16. Convert the given CFG to CNF. Consider the given grammar G1:

S → a | aA | B

A → aBB | ε

B → Aa | b

17. Construct PDA for language L = {WW^R | W ϵ (0, 1) *}.
18. Construct PDA Machine for language L = {W C W | W ϵ (0, 1) +}.
19. Prove that the following language is ambiguous and convert into Unambiguous S → S + S | S * S | a | b Where W = a + a * b.
20. Design a Turing Machine to convert the Binary value to 2's Complement.
21. Construct the Turing Machine for language L = {W C W | W ϵ (0, 1) *}.
22. Identify the language L= {a ^ x where x is a prime number}.
23. Design the Turing Machine for the Language L={a^n b^n c^n | n>=0}
24. Construct the Turing Machine to implement adder for unary value.
25. Differentiate between Decidable and Undecidable problem.
26. Prove that the language L = {aP|P is a prime } is not regular .
27. Using Pumping Lemma, prove that the language A = {a^n b^n C^n| n≥1} is not CFL .
28. Convert FA to Regular Expression using Arden's Theorem.



29. Construct Turing machine for

$$L = \{0^{2^n} : n \geq 0\}$$

30. Construct a TM for the language L = $\{0^n1^n2^n\}$ where n≥1.
31. Construct TM for the addition function for the unary number system.