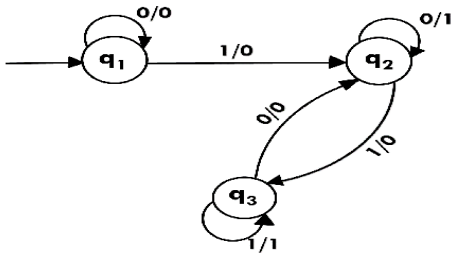
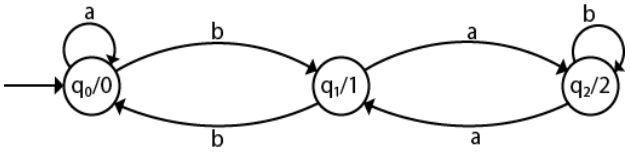
ASSIGNMENT

Unit-1

Q1: Convert the following Mealy machine to Moore machine.



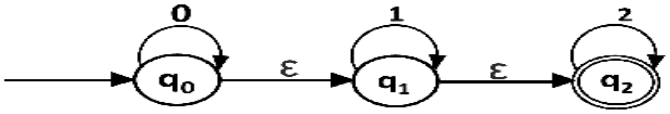
Q2: Convert the given Moore machine into its equivalent Mealy machine.



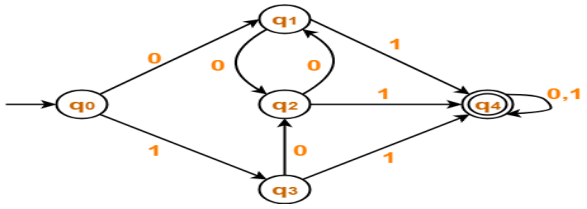
Q3: Difference between NFA and DFA. Also specify their transition function.

Q4: Convert the given NFA to DFA.

Q5: Convert the given NFA to DFA.



Q6: Minimize the given DFA-



Unit-2

Q7: Write the regular expression for the language containing the string in which every 0 is immediately followed by 11.

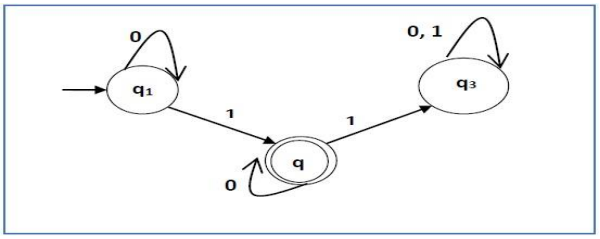
Q8: Write the regular expression for the language containing the string over {a, b} in which there should be at least two occurrences of b's between any two occurrences of a's.

Q9: Find out whether the language L ={$a^n b^n$ | n>=1}is regular or not using Pumping lemma.

Q10: Construct a ε-NFA for the following regular expression.

(0+1)*(00+11)(0+1)*

Q11: Find regular expression for the following DFA using Arden's Theorem-



Q12: Find regular expression for the following DFA using Arden's Theorem-

UNIT-3

Q13: Construct a CFG over {a,b} generating a language consisting of equal number of a's and b's.
Q14: Construct a CFG over {0,1} for the regular expression (0+1)*
Q15: Define ambiguous grammar. Show that the following grammar is ambiguous S- >aSbS|bSaS|Ɛ by taking any input string.
Q16: Let G be the grammar

A → AA
A → (A)
A → a
For the string "a(a)aa" find

i) leftmost derivation, ii) parse tree, and iii) Is the grammar ambiguous?
Q17: Convert the following CFG to CNF(Chomsky normal form):

S → ASA | aB
A → B | S
B → b | ε
Q18: Convert the following grammar to GNF (Greibach Normal Form):
S → CA|BB
B → b|SB
C → b
A → a

UNIT-4

Q19: Find out whether the language L = $\{x^n y^n z^n \mid n \geq 1\}$ is context free or not using Pumping Lemma.

Q20: State the closure properties of Context Free Languages.

Q21: State and prove the Decision properties of Context- Free Languages.

Q22: Design a PDA that accepts L = { ww^R | w = (a+b)* }

Q23: Design a PDA to accept the set of strings with twice as many 0's as 1's.

Q24: Construct PDA for the given CFG, and test whether 010^4 is acceptable by this PDA.

S → 0BB

B → 0S | 1S | 0

Q25: Construct the PDA equivalent to the given CFG with the following productions

S→A, A→BC, B→ba, C→ac

UNIT-5

Q26: Discuss the Chomsky hierarchy of languages with example.
Q27: What is an undecidable problem, Discuss? Does the Post correspondence problem with two lists x=(001,0011,11,101) and y=(01,111,111,010) has a solution?
Q28: State the Post Correspondence Problem of Turing Machine. Find the solution for the correspondence system given below:
A = (b, bab3, ba) and B = (b3, ba, a). The input set is ∑ = {0, 1}.
Q29: Design a TM for the language L = $\{0^n1^n2^n\}$ where n≥1
Q30: Design a Turing machine that Reverses the given string {abb}.