**UNIT-1(short quensions)**

1.Explain transition diagram, transition table with example.

2. Define transition function of DFA.

3. Define ε –transitions.

4. Construct a DFA to accept even number of 0’s.

5. Define Klean closure.

6. Construct a DFA to accept empty language.

7. Explain power of an alphabet?

8. Write transition diagram for DFA accepting string ending with 00.

9. Write transition diagram for DFA to accept exactly one a.

10. Define the language of NFA.

**UNIT – II(short quensions)**

1. Define Regular Languages.

2. Define Pumping Lemma.

3. Write the applications of pumping lemma for regular languages.

4. List any two applications of regular expression.

5. Define Context Free Grammars.

6. Write through an intermediate state whose number is not greater than K-1.

7. Write regular expression for denoting language containing empty string.

8. Differentiate LMD and RMD.

9. Define ambiguous grammar.

10.State the following grammar is ambiguous. S-> AB|aaB A->a / Aa B->b

**UNIT – III(short quensions)**

1. Define Greibach normal form.

2. Define nullable Variable.

3. State the symbol is used to label the interior node of the parse tree.

4. Define the language of PDA accepted by final state.

5. List the steps to convert CFG to PDA.

6. Define CNF.

7. Define PDA.

8. Define NPDA.

9. Differentiate between deterministic and nondeterministic PDA.

**UNIT – IV(short quensions)**

1. Write the Turing Machine model.

2. Explain the moves in Turing Machine .

3. Define an ID of a Turing Machine?

4. Define the Language of Turing Machine.

5. List types of TM.

6. Define Turing Machine.

7. Write the difference between Pushdown Automata and Turing Machine.

8. Explain Church’s Hypothesis.

9. Define Context sensitive language.

10. Define multi head Turing Machine, multi dimensional Turing Machine.

**UNIT – V(short quensions)**

1. Define Chomsky hierarchy of languages.

2. Define Universal Turing Machine .

3. Define LR(0) grammars.

4. Define decidability & undecidability .

5. Define P,NP problems.

6. Give examples for Undecidable Problems.

7. Define Turing Machine halting problem.

8. Define Turing Reducibility .

9. Define PCP.

**UNIT-1(LONG QUENSIONS)**

1.Define language over an alphabet with examples. Write a DFA to accept set of all strings ending with 010.

2. Give example for Minimize the DFA .

3. Construct a Moore machine to accept the following language. L = { w |w mod 3 = 0} on ∑ = { 0,1,2}

4. Write any four differences between DFA and NFA .

5. Convert NFA with Ɛ to NFA with an example.

6. Construct NFA for (0 + 1)\*(00 + 11)(0 + 1)\* and Convert to DFA.

7. Construct NFA for (0 +1)\*(00 + 11)(0 + 1)\* and Draw the transition table and transition diagram and example strings.

8. Illustrate given 2 FA‘s are equivalent or not with an example.

9. Construct Mealy machine for (0 + 1)\*(00 + 11) and convert to Moore machine. 10. Convert Moore machine to Mealy machine with an example

**UNIT - II**

1. Convert Regular Expression 01\* + 1 to Finite Automata.

2. Convert given Finite Automat to Regular Expression using Arden’s theorem.

3. Convert given Finite Automat to Regular Expression using standard method(Rij K method)

4. Explain Identity rules . Give an example using the identity rules for the simplification.

5. Construct Regular grammar for the given Finite Automata.

6. Use G be the grammar bA⏐ aB→S bAA⏐aS ⏐ a →A aBB⏐ bS ⏐ b →B For the string aaabbabbba , Find a. Leftmost Derivation. b . Rightmost Derivation. c. Derivation Tree.

7. Explain the properties, applications of Context Free Languages

8. Construct right linear and left linear grammars for given Regular Expression.

9. Construct a Transition System M accepting L(G) for a given Regular Grammar G.

10. Discuss the properties of Context free Language. Explain the pumping lemma with an example.

**UNIT – III**

1. Write a short notes on Chomsky Normal Form and Griebach Normal Form.

2. Show that the following grammar is ambiguous with respect to the string aaabbabbba. aB | bA->S aS| bAA| a->A bS | aBB | b->B

3. Use the following grammar : ABC | BbB->S aA | BaC|aaa->A bBb| a|D->B CA|AC->C ɸ->D Eliminate ε-productions. Eliminate any unit productions in the resulting grammar. Eliminate any useless symbols in the resulting grammar. Convert the resulting grammar into Chomsky Normal Form

4. Illustrate the construction of Griebach normal form with an example.

5. Show that the following CFG ambiguous. iCtS | iCtSeS | a->S b->C

6. Discuss the Pumping lemma for Context Free Languages concept with example {an b n c n where n>0}

7. Write the procedure to convert CFG to PDA and also convert the following CFG to PDA. B | aAA->S aBB | a->A bBB|A->B a->C

8. Construct a PDA to accept the language L ={ a n b n | n >= 1} by a final state. Draw the graphical representation of the PDA. Also show the moves made by the PDA for the string aaabbb

9. Construct NPDA for L = { W WR /W ϵ ( 0 + 1)\*} M = ({q1,q2},{0,1}.{R,B,G},δ,q1,R,ϕ}

10. Write the procedure to convert from the given PDA to a CFG. Convert the following example. δ(q0,b,z0)={q0,zz0) δ(q0, b, z)=(q0,zz) δ(q0, ϵ ,z0)=(q0,ϵ) δ(q0,a,z) = (q1,z) δ(q1,b,z)=(q1,ϵ) δ(q1,a,z0)=(q0,z0)

**UNIT – IV**

1. Define a Turing Machine. With a neat diagram explain the working of a Turing Machine.

2. Construct a Turing Machine which shift non block symbols 3 cells to the right.

3. Construct a Turing Machine to accept the following language. L = { 0n 1 n 0 n | n ≥1}

4. Construct a Turing Machine that accepts the language L = {0n 1 n | n ≥1}. Give the transition diagram for the Turing Machine obtained and also show the moves made by the Turing machine for the string 000111.

5. Construct a Turing Machine to accept the language L= { w#w R | w ϵ ( a + b ) \*}

6. Write short notes on Recursive and Recursively Enumerable languages?

7. Write the properties of recursive and recursively enumerable languages

8. Construct a Turing Machine to accept strings formed with 0 and 1 and having substring 000.

9. Construct a Turing Machine that accepts the language L = {1n 2 n 3 n | n ≥1}. Give the transition diagram for the Turing Machine obtained and also show the moves made by the Turing machine for the string 111222333.

**UNIT – V**

1. Explain the concept of undecidability problems about Turing Machine

2. Write a note on Modified PCP and Multi tape Turing machine.

3. Explain individually classes P and NP

4. Write a shot notes on post's correspondence problem and check the following is PCP or not. I A B 1 11 111 2 100 001 3 111 11

5. Explain the Halting problem and Turing Reducibility.

6. Write a short notes on universal Turing machine

7. Write a short notes on Chomsky hierarchy.

8. Write a short notes on Context sensitive language and linear bounded automata.

9. Write a short notes on NP complete , NP hard problems.