CSE/CI 311 (R-20)

Total No. of Questions : 10] [Total No.of Pages : 02

III/IV B. Tech. DEGREE EXAMINATIONS, DECEMBER - 2022

First Semester

CSE / CI

AUTOMATA THEORY AND COMPILER DESIGN

Time : **Three Hours** Maximum : **60** Marks

Answer ONE question from each Unit.

All questions carry equal marks. 5x12=60 M

UNIT - I

1. a) Describe the closure properties and limitations of Regular Languages.
   b) Construct the NFA for following Regular expression (0+1)*(01+110).

(OR)

2. a) Write the formal definition of an NDFA? Explain the operation of a Deterministic Finite Acceptor (DFA) with neat diagram.
   b) Illustrate the steps for conversion from Finite Automata to Regular Expression with an example.

UNIT - II

3. a) Describe the concept of Inherent ambiguity of Context Free Languages with examples.
   b) List the tuples in CFG? How CFG is used in parsing, give the applications.

(OR)

4. a) Explain the Pumping Lemma for Regular Languages with a suitable example.
   b) What is inherent ambiguity? Elaborate the concept of Inherent Ambiguity of Context Free Languages.

UNIT - III

5. a) Discuss about Multi Tape Turing Machines with examples.
   b) Discuss the properties of Recursive and Recursively Enumerable Languages.

(OR)

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6. a) Illustrate the different techniques for construction of Turing Machine.
   b) Explain the concept of Halting Problem is Undecidability using reductions.

UNIT - IV

7. a) List the phases of compiler? Demonstrate the Analysis and Synthesis Model of Compiler.
   b) Outline the production rules to compute the FIRST and FOLLOW positions for a given non-terminal.

(OR)

8. a) Distinguish between Compiler and Interpreter.
   b) Construct a CLR parsing table for the given grammer: $S \rightarrow CC, \rightarrow aC, C \rightarrow d$.

UNIT - V

9. a) Explain the method of generating syntax directed definition for control statements?
   b) Summarize the Loop optimization techniques with examples.

(OR)

10. a) Translate the expression - (a+b)*(c+d) + (a+b+c) into quadruples, triples and indirect triples?
    b) Elaborate the concept of Global data flow analysis with an example.