

FORMAL LANGUAGES AND AUTOMATA THEORY

Subject Code: 10CS56 I.A. Marks : 25
Hours/Week : 04 Exam Hours: 03
Total Hours : 52 Exam Marks: 100

PART - A

UNIT - 1 **7 Hours**
Introduction to Finite Automata: Introduction to Finite Automata; The central concepts of Automata theory; Deterministic finite automata; Nondeterministic finite automata

UNIT - 2 **7 Hours**
Finite Automata, Regular Expressions: An application of finite automata; Finite automata with Epsilon-transitions; Regular expressions; Finite Automata and Regular Expressions; Applications of Regular Expressions

UNIT - 3 **6 Hours**
Regular Languages, Properties of Regular Languages: Regular languages; Proving languages not to be regular languages; Closure properties of regular languages; Decision properties of regular languages; Equivalence and minimization of automata

UNIT - 4 **6 Hours**
Context-Free Grammars And Languages : Context-free grammars; Parse trees; Applications; Ambiguity in grammars and Languages

PART - B

UNIT - 5 **7 Hours**
Pushdown Automata: Definition of the Pushdown automata; the languages of a PDA; Equivalence of PDA's and CFG's; Deterministic Pushdown Automata

UNIT - 6 **6 Hours**
Properties of Context-Free Languages: Normal forms for CFGs; The pumping lemma for CFGs; Closure properties of CFLs

UNIT - 7 **7 Hours**
Introduction To Turing Machine: Problems that Computers cannot solve; The turning machine; Programming techniques for Turning Machines;



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Extensions to the basic Turing Machines; Turing Machine and Computers.

UNIT – 8

6 Hours

Undecidability: A Language that is not recursively enumerable; An Undecidable problem that is RE; Post's Correspondence problem; Other undecidable problems.

Text Books:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman: Introduction to Automata Theory, Languages and Computation, 3rd Edition, Pearson Education, 2007.
(Chapters: 1.1, 1.5, 2.2 to 2.5, 3.1 to 3.3, 4, 5, 6, 7, 8.1 to 8.4, 8.6, 9.1, 9.2, 9.4.1, 9.5)

Reference Books:

1. K.L.P. Mishra: Theory of Computer Science, Automata, Languages, and Computation, 3rd Edition, PHI Learning, 2009.
2. Raymond Greenlaw, H. James Hoover: Fundamentals of the Theory of Computation, Principles and Practice, Elsevier, 1998.
3. John C Martin: Introduction to Languages and Automata Theory, 3rd Edition, Tata McGraw-Hill, 2007.
4. Thomas A. Sudkamp: An Introduction to the Theory of Computer Science, Languages and Machines, 3rd Edition, Pearson Education, 2006.

DATABASE APPLICATIONS LABORATORY

Subject Code: 10CSL57

I.A. Marks : 25

Hours/Week : 03

Exam Hours: 03

Total Hours : 42

Exam Marks: 50

1. Consider the following relations:

Student (*snum*: integer, *sname*: string, *major*: string, *level*: string, *age*: integer)


Class (*name*: string, *meets at*: string, *room*: string, *d*: integer)

Enrolled (*snum*: integer, *cname*: string)

Faculty (*fid*: integer, *fname*: string, *deptid*: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class. Level is a two character code with 4 different values (example: Junior: JR etc)

Write the following queries in SQL. No duplicates should be printed in any of the answers.


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