24P160 (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P CSS1 C03 - THEORY OF COMPUTATION

(Computer Science)

(2019 Admission onwards)

Time : 3 Hours Maximum : 30 Weightage

Part-A

Answer any ***four*** questions. Each question carries 2 weightage.

1. Explain Alphabets and Strings in detail.
2. Illustate Epsilon NFA with example.
3. Illustrate properties of regular expressions.
4. Design PDA for ON 12N.
5. Show that ww is not context free using pumping lemma.
6. Explain any 2 closure properties of Context free languages.
7. Explain Turing acceptable and Turing decidable languages.

(4 × 2 = 8 Weightage)

Part-B

Answer any ***four*** questions. Each question carries 3 weightage.

8. Design a DFA and a NFAaccepting string ends with 11 or ends with 00.
9. Explain Arden's theorom with an example.
10. Describe any 5 closure properties of regular sets.
11. Show that the grammar S -> a/abSb/aAb, A -> bS/aAAb is ambiguous/not ambigous.
12. Design a turing machine accepting ww wϵ (a+b)*.
13. Comment on post correspondence problem with example.
14. Describe in detail about P and NP , NP complete,NP hard.

(4 × 3 = 12 Weightage)

Part-C

Answer any ***two*** questions. Each question carries 5 weightage.

15. Explain Equivalence of Deterministic and Nondeterministic Finite Automata? Construct a nondeterministic finite automaton accepting the set of all strings over {a, b} ending in aba. Use it to construct a DFA accepting the same set of strings.

16. Explain DFA state minimization with example.

17. Explain Church-Turing Thesis.

18. Describe in brief decidability and undecidability in Turing Machine? State and prove Turing Machine Halting problem.

(2 × 5 = 10 Weightage)

****