20PCSCT1001

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
M.Sc.(CS) - END SEMESTER EXAMINATIONS APRIL - 2023
SEMESTER - I
20PCSCT1001 - Theory Of Computation

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Differentiate NFA and DFA.
2. a) Draw the transition diagram for an identifier.
   b) Define the term Epsilon transition.
3. List out the applications of regular languages. Write down the Algebraic laws for regular expression.
4. Describe how to Minimize the DFA.
5. Compare Context Free grammar with Regular expression. When is a grammar ambiguous?
6. Explain about the Chomsky hierarchy of the language.
7. Design a Turing machine for the following: a) Reverses the given string $\{abb\}$.
8. Predict whether the following languages are recursive or recursively enumerable.
   (i) Union of two recursive languages.
   (ii) Union of two recursively enumerable languages.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Construct a DFA, that accepts all the strings over $\Sigma = \{a, b\}$ that do not end with ba.
10. Prove that a language is not regular.
11. State and Prove pumping lemma for Context free languages.
12. Describe the Post's Correspondence Problem with an example.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Prove that the CFG and PDA accept the same class of language.

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