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(Pages : 2)

Name...................................

Reg. No...............................

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2020

BCA

BCA 3C 06—THEORY OF COMPUTATION

Time : Two Hours

Maximum : 60 Marks

Section A (Short Essay Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. Define Top Down Parsing.

2. Explain algebraic laws for regular expression.

3. Differentiate between Mealy machine & Moore machine.

4. What are the characteristics of automaton ?

5. What are the operations on sets ?

6. Define onto function with example.

7. What is yield ?

8. Explain representation of a digraph.

9. Explain Turing Machine Model.

10. Define Parse Tree with example.

11. Prove the following theorem by Induction : $1 + 2 + 3 + \ldots + n = n(n + 1)/2$.

12. Explain Strings & their properties.

(8 × 3 = 24 marks)

Turn over

Section B (Short Essay Type Questions)

Answer at least **five** *questions.*
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.

13. Explain the steps for construction of minimum automaton.

14. Write different methods for representing Turing Machines.

15. Prove that the number of leaves in a binary tree T is $(n + 1)/2$, where 'n' is the number of vertices.

16. Find L (G), if $G = \left(\{S\}, \{0, 1\}, \{S \to 0S1, S \to \wedge\}\right.$.

17. Construct a regular expression corresponding to the given transition table.

State	0	1
$\to \boxed{q^1}$	q^1	q^2
q^2	q^3	q^2
q^3	q^1	q^2

18. Prove the Pigeonhole principle by induction.

19. Explain algebraic laws for regular expression.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 marks.

20. Explain Kleene's Theorem.

21. Explain Chomsky classification of languages with example.

(1 × 11 = 11 marks)