D 31771 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2022

B.C.A.

BCA 3C 06—THEORY OF COMPUTATION

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

Section A (Short Essay Type Questions)

Answer any **ten** *questions.*
Each question carries 2 *marks.*
Ceiling 20 *Marks*

1. What is an Automaton ?
2. What is Monotonic Grammar ?
3. Define SurjectiveFunction with example.
4. What are the components of a Finite Automaton ?
5. Define PDA.
6. What is Regular Grammar ?
7. Define Function.
8. Define Context Free Grammar.
9. Prove by the principle of induction $1+4+7+\ldots+(3n-2)=\frac{n(3n-1)}{2}$.
10. What is a Moore Machine ?
11. Explain Type-1 grammar.
12. What is a Graph ? How a graph represented ?

(10 × 2 = 20 marks)

Turn over

Section B (Short Essay Type Questions)

Answer any **six** *the questions.*
Each question carries 5 *marks.*
Ceiling 30 *Marks*

13. Prove that, If L is regular then L^T also regular.
14. Write different methods for representing Turing Machines.
15. Explain derivation trees.
16. Explain ambiguity in CFG with example.
17. Explain Arden's theorem.
18. Explain about Parsing and different types of Parsing.
19. Define Tree. Prove that the number of vertices in a binary tree is odd.

(6 × 5 = 30 marks)

Section C

Answer any **one** *questions.*
The question carries 10 *marks.*

20. Explain simplification of Context Free Languages.
21. Construct a finite automaton equivalent to the regular expression $(0+1)^*(00+11)(0+1)^*$.

(1 × 10 = 10 marks)