BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - IV COMPUTER :SUMMER- 2022
SUBJECT : MODELS OF COMPUTATION

Day : Thursday

Date : 16-06-2022   **S-24234-2022**

Time : 10:00 AM-01:00 PM

Max. Marks : 60

N.B.:

  1)   All questions are **COMPULSORY**.
  2)   Figures to the right indicate **FULL** marks.
  3)   Draw neat and labeled diagram **WHEREVER** necessary.
  4)   Assume suitable data, if necessary.

Q.1   Using Mathematical Induction prove that the sum of first n natural numbers is $n(n+1)/2$ **(10)**

OR

Q.1   Define Finite Automata with output. Design a Moore Machine to find residue mod 3 for binary string treated as binary integer.   **(10)**

Q.2   What is regular expression. Prove that regular sets are closed under Union.   **(10)**

OR

Q.2   Give Pumping Lemma for Regular Languages.   **(10)**

Q.3   Convert the Grammar G to Chomsky Normal Form   **(10)**
G = ({S,A,B}, {a,b}, P, S) where P consist of productions
S -> bA|aB
A->bAA|aS|a
B->aBB|bS|b

OR

Q.3   Define Context Free Grammar. Describe Greibach Normal Form.   **(10)**

Q.4   Construct a PDA that accepts {wcw^r | w is in (0+1) *}   **(10)**

OR

Q.4   Define Deterministic PDA. Prove that there exist a PDA for Context Free Language.   **(10)**

Q.5   Define a Turing Machine. Design a Turing Machine for Proper Subtraction of m – n where m>n.   **(10)**

OR

Q.5   List and Explain Modifications of Turing Machine.   **(10)**

Q.6   Explain the Phases for Compiler.   **(10)**

OR

Q.6   How Context Free Grammar is used in Syntax Analysis.   **(10)**

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