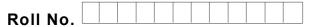
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Total No. of Pages : 02

Total No. of Questions : 09

## MCA (E-I) (2015 & Onwards) (Sem.-3) THEORY OF COMPUTATION Subject Code : MCA-305B M.Code : 74078

Time: 3 Hrs.

Max. Marks:60

# INSTRUCTIONS TO CANDIDATES :

- 1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students have to attempt any ONE question from each SECTION.
- 2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

### **SECTION-A**

- 1. Describe various applications of Finite Automata.
- 2. Explain the principle of Mathematical and Structural Induction along with the examples.

# SECTION-B

- 3. Draw a FA with epsilon moves that accepts strings over  $\Sigma = \{a, b, c\}$  having any number of a's followed by any number of b's followed by any number of c's.
- 4. a) Briefly explain Arden's method for the conversion of NFA into DFA with example.
  - b) Discuss MyHill-Nerode Theorem.

### **SECTION-C**

- 5. Convert the grammar  $S \rightarrow ABb | a, A \rightarrow aaA | B, B \rightarrow bAb$  into Greibach Normal Form.
- 6. Explain the process of Push Down Automata. With the help of example differentiate between Deterministic *vs*. Non Deterministic PDA.

### SECTION-D

- 7. Construct a Turing Machine to perform Multiplication.
- 8. Describe Chomsky Hierarchy of Grammar and indicate their recognizers.

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#### **SECTION-E**

#### 9. Write briefly :

- a) Define Recursive Set.
- b) Write short note on Turing computable.
- c) Define Unambiguous Grammar.
- d) What is Primitive Recursive?
- e) Explain Automaton.
- Construct a DFA over  $\Sigma = (a,b)$  which produces not more than 3 a s. f)
- g) State the difference between NFA and DFA.
- h) Define Strong Induction Principle.
- www.FirstRanker.com Define Pumping Lemma for CFG?. i)
- Explain Parse Trees. i)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.