

B. C. A. (Third Semester) Examination, 2017-18

Paper Third

BCA - 703

[Theory of Computation]

Time : Three Hours]

[Maximum Marks : 70

Note : Attempt any *five* questions. All questions carry equal marks.

- Q1. (a) What do you mean by Automata? Define finite automata. 7
 (b) Design DFA over the alphabet $\{a, b\}$ which consist even no. of a and no. of b are multiple of 3. 7
- Q2. (a) Write the steps for conversion of DFA to N DFA. 7
 (b) State the principle of mathematical induction. 7
- Q3. (a) Differentiate between regular expression and regular language. 7
 (b) What are the application of turing machine? 7
- Q4. (a) What is an ambiguous grammer? Give example. 7
 (b) Write briefly about the programming technique for turing machine. 7
- Q5. (a) State the halting problem of turing machine. 7
 (b) Design a turing machine which reverse the given string $\{abb\}$. 7
- Q6. Design a finite automata to accept the string that always ends with 00. 14
- Q7. The following two regular expressions :
 $r_1 = a^* + b^*$ $r_2 = ab^* + ba^* + b^*a + (a^*b)^*$
 (i) Find a string corresponding to r_2 but not to r_1 ?
 (ii) Find a string corresponds to both r_1 and r_2 ?