6. What are turing machines ? Design a turing machine for the given language : **15**

L = $\{ww^T|$ w is a string over 0's and 1's

Unit IV

7. Explain Chomsky hierarchy of grammars and relation between different grammars ? **15**

8. Write short notes on the following :

(a) Primitive recursive functions

(b) Context sensitive languages. **7.5×2**

No. of Printed Pages : 04 **Roll No. .....**

DD-685

M.C.A. EXAMINATION, May 2018

(Fourth Semester)

(B. Scheme) (Main & Re-appear)

(MCA)

MCA552

THEORY OF COMPUTATION

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Differentiate between deterministic finite automata and non-deterministic finite automata. **7**

(b) Design a finite automata for accepting all string over {0, 1} having 3 consecutive 0's at the end of string. **8**

2. (a) What are regular expressions ? Write a regular expression for a inite automata accepting all strings over {*a, b*} such that all strings have '*ab*' substring. **5**

(b) Convert the given moore machine to mealy machine : **10**

Input

State	**0**	**1**	**Output**
→Q0	Q1	Q2	0
Q1	Q2	Q3	1
Q2	Q2	Q0	1
Q3	Q1	Q2	0

Unit II

3. (a) Prove using pumping lemma that the given language L is not regular. L = $\{a^n b^n \mid n >= 0\}$. **10**

(b) What is meant by ambiguous grammar ? Explain with an example. **5**

4. Reduce the given grammar removing useless symbols and unit productions : **15**

$S \rightarrow AB/a$

$A \rightarrow BC$

$B \rightarrow AC$

$C \rightarrow D/a$

$D \rightarrow E/a$

$E \rightarrow b$

Unit III

5. Design a PDA for the given language : **15**

$\{a^n b^n \mid n >= 0\}$.