MCA–955 **MCA-10/ PGDCA–08**

M.C.A. DEGREE/P.G.D.C.A. EXAMINATION — JANUARY, 2015.

First Year

THEORY OF COMPUTER SCIENCE

Time : 3 hours Maximum marks : 75

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1. Define formal definition and languages.

2. Mention the different types of grammer with example.

3. What is equivalence relation? Explain with example.

4. Let $A=\{1, 0, 0\}$. Find A^n for $n=0, 1, 2$ and 3.

5. Construct a PDA to accept a given language L by final state where $L=\{a^n b^n / n \geq 1\}$.

6. Illustrate the various applications of computability.

7. What are the limitations of Turing machines?

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

8. Construct a grammar for the language $\alpha(G)=\{a^i b^{2i} / i \geq 1\}$.

9. Find a pharse structure grammer to generate the set $\{0^m 1^n / m$ and n are non negative integers$\}$.

10. What are the strings in the regular in the sets specified by the regular expression

$10^*, (1\,0^*), 0 \cup 01, 0(0 \cup 1)^*$ and $(0^* 1)^*$?

11. Prove the theorem : A set is generated by regular grammer if and only if it is a regular set.

12. Find a turning machine that recogonize the set of bit strings which have 1 as their second bit (i.e. the regular set $(0 \cup 1)1\,(0 \cup 1)^*$).

13. Write some complexity in computer science.

14. Find the Turing machine that recogonize the set $\{0^n 1^n / n \geq 1\}$.