Unit IV

8. (a) State pumping Lemma for context free language. **8**

(b) Define formally Turing machine Model. **8**

9. Define Push Down Automaton (PDA) and Non-Deterministic Pushdown Automaton (NPDA) in detail. **16**

PAPER ID—20332

M.C.A. EXAMINATION, 2024

(Second Semester)

THEORY OF COMPUTATION AND COMPILERS

Code : MCA-202

Time : 3 *Hours* *Maximum Marks :* 80

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 *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Define LL(1) Grammars.

(b) Define regular grammar with suitable example.

(c) State pumping Lemma for context free language

(d) What is a derivation tree ? Give an example.

(e) Explain any *two* closure properties of CFL.

(f) State any *four* types of proofs.

(g) What are recursive languages ?

(h) What is Multi-tape Turing Machine ?

8×2=16

Unit I

2. Define Assembler *vs.* Compiler *vs.* interpreter. What is the role of Compiler in system programing ? **16**

3. Explain the following :

(a) Code generation **8**

(b) Symbol table management. **8**

Unit II

4. Differentiate between Lexical analysis and Parsing analysis. What is the role of Lexical analysis ? **16**

5. Define DFA and NDFA in detail with example. **16**

Unit III

6. Explain the following : **4×4=16**

(a) Parse tree

(b) Derivations

(c) Ambiguity

(d) Associativity and Precedence of operators.

7. Prove that union of two recursive languages is recursive. **16**