Roll No. .....

MCA/D09

Principles of Programming Languages

Paper: MCA-305

5479

Time: Three Hours] [Maximum Marks: 80

Note:- Question No.**1** is compulsory. In addition to this attempt FOUR questions by selecting ONE question from each unit.

1. (i) Give the accessing formula to access an element a [i, j] of a two dimensional array stored in column major order. 3
   (ii) What is slice? 3
   (iii) What is implicit type declaration? 3
   (iv) Differentiate between left recursive and right recursive regular grammar. 3
   (v) What is an ambiguous grammar? 3
   (vi) Define polymorphism 3
   (vii) What is rendezvous? 3
   (viii) Draw the FSA for the following extended BNF : [+1-] {digit} * 3

UNIT-I

2. Differentiate between the following:
   (a) Static scope and dynamic scope
   (b) Implicit and explicit type conversion
   (c) Name equivalence and structural equivalence 14
3. Discuss the specification and implementation of following data types in various languages:
   (a) Integer
   (b) Boolean
   (c) Array
   (d) User defined data type. 14

UNIT-II

4 (a) Differentiate between Call by value-result and call by reference parameter transmission techniques. Use suitable examples.
   (b) What do you understand by ambiguous grammar? Explain using suitable examples. 14
5. (a) Give the finite state automaton and the regular grammar for the language composed of all binary numbers that contain at least three consecutive 1 's.
   (b) Write a grammar to identify a string consisting of characters a-z and 0-9. The first character of the string is to be a letter only. Draw an FSA also.
   (c) Differentiate between Context free grammar and context sensitive grammar. 14

UNIT-III

6. Give an example of a feature from C++ or Java that promotes each of the following object oriented principles code reuse, type safety, abstraction and encapsulation. Also give the examples that violate these principles. 14
7. Write short notes on the following:
   (a) Virtual function

(b) Applications of functional language

(c) Friend function.

UNIT-IV

8. (a) What is concurrent processing? Explain the use of semaphore in synchronization of tasks.

   (b) Discuss the use of cut and fail predicates in PROLOG. 14

9. (a) What do you understand by logic programming? Write a detailed note on resolution and unification.

   (b) Write short notes on :

   (i) DML (ii) Monitor 14