Roll No……. **10380**

MCA/ D-I3

PRINCIPLES OF PROGRAMMING LANGUAGES

Paper—MCA—305

Time allowed: 3 hours] [Maximum marks : 80

Note: Attempt five questions in all. Q. No. 1 is compulsory. In A addition to that attempt four more questions-selecting exactly one question from each unit.

Compulsory Question

1. (a) What are the various abstractions in programming languages ? Define each of them.

(b) What do you mean by type checking? Give example.
(c) What is ambiguous grammar? Provide an example.
(d) State the rules for structured programming.

(e) Differentiate between classes and modules.

(f) What do you mean by delayed evaluation in functional programming ?

(g) What is unification? Give an example.
(h) What is multithreading? 8X3=24

Unit—I

2. (a) State and explain the features of a good programming language. 7
(b) What do you understand by binding? How can you classify bindings? Explain with suitable examples. 7

3. (a) For language with which you are familiar, find an example of a primitive operation
(i) That has an implicit argument
(ii) That has a side effect
(iii) A That is undefined for some data object in its specified domain. ‘ .
(iv) That is self-modifying. 4

(b) What are the specifications of data structure types? Explain. 5
(c) Suppose we have two array in ‘C’:

```
int x [IO];
int y [IO];
```

Why won’t the assignment x = y compile in C? Can the declarations be fixed so that assignment will work? 5

Unit-II

4. (a) Show that the S ——) aSb/abS/A grammar is ambiguous, and find an equivalent unambiguous grammar. 7
(b) Explain about context-free grammars with examples. 7
(a) Explain about static scoping rule with examples. 7
(b) What are different parameter passing methods? Discuss with examples; 7

Unit—III

6. (a) What are the various ways that software component should be modified for reuse ? 7
(b) Describe various implementation issues in Object- Oriented languages. 7

7. (a) The following C function computes the power a where a is a floating - point‘ number and b is a (non-negative) integer :

double power (double a, int b)
{ int I ; double temp = 1. 0; for (i-*4 1; i <=,b; I ++)temp * =a; return temp;} I .
(i) Rewrite this procedure in functional form.
(Il) Rewrite your anwer to (i) using an accumulating parameter to make it tail recursive. 10
(b) Describe major features of functional programming. 4

Unit—IV

8. (a) What are the various problems in logic programming ? Explain 7
(b) How following operations can be performed SQL? V
(i) Extracting data from multiple tables.
(ii) Applying constraints on tables.
(iii) Altering the contents and structure of a table. 7

9. (a) Explain the process of synchronization with the help of semaphores. 7

(b) Describe the statement-level, procedure-level and program-level parallelism in parallel programming. 7