

Roll No. ....

Total Pages : 04

BT-3/D-19

33131

PRINCIPLES OF PROGRAMMING

LANGUAGES

ES-227A

Time : Three Hours]

[Maximum Marks : 75

**Note :** All questions in Part A and Part B are compulsory.  
Attempt any *four* questions from Part C, by selecting  
at least *one* question from each Unit.

**Part A (15 marks)**

**5×3=15**

Answer the following questions :

- (i) Recognize the role of using assignment and initialization in programming languages. **3**
- (ii) Identify the basic nature of generic subprogram with the help of suitable example. **3**
- (iii) Interpret the role of using synchronization through semaphores. **3**
- (iv) What are the problem implications which may arise during evaluation of tree representation of an arithmetic expression ? **3**
- (v) Discuss the function of major run time elements which require storage. **3**

## Part B (20 marks)

### Unit I

2. Discuss the role of persistence for defining variables, constants and literals. 5

### Unit II

3. Identify the factors which influence the evolution of data types in the programming languages. 5

### Unit III

4. In what way subprogram level concurrency can be achieved to control the sequence of a program ? 5

### Unit IV

5. Briefly explain the perspective of functional programming. 5

## Part C (40 marks)

### Unit I

6. (a) Identify and explain the general problems of describing syntax. Also elaborate the concept of dynamic semantics in programming languages. 5
- (b) Define type checking and type conversion. Explain both of them using suitable programs or algorithms. 5

7. (a) With the help of diagrams, explain and compare the translation, compilation and interpretation. 5
- (b) Why the breakpoints and assertions are useful components in programming languages ? 5

## Unit II

8. (a) Give the accessing formula for computing the location of component  $A[I, J]$  of a matrix  $A$  declared as :  $V : \text{array } [LB_1..UB_1, LB_2..UB_2]$  where  $A$  is stored in column-major order. 5
- (b) Investigate the logic of using type definitions in programming languages. Give the justification by using Name equivalence and Structural equivalence with examples. 5
9. Explain the following :
- (i) Type conversion and coercion
- (ii) Packed storage representation and whole vector operations. 10

## Unit III

10. (a) Explain the following by using suitable programs or algorithms : 6
- (i) Call by address
- (ii) Call by Name
- (b) Differentiate between recursive subprograms and routines. 4

11. (a) How the synchronization through semaphores is achieved ? Mention its advantages and disadvantages. 6
- (b) Differentiate between explicit and explicit sequence control. 4

#### Unit IV

12. Explain the following :  
(i) Heap storage management  
(ii) Stack based storage management. 10
13. Identify and explain various functional definitions and types of standard functions available in the functional programming language of LISP. 10

