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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 : 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**