T.E. (Computer) (Sem. II) Examination, 2010
PRINCIPLES OF PROGRAMMING LANGUAGES
(2003 Course)

Time : 3 Hours   Max. Marks : 100

Instructions : *1) Answer **any three** questions from **each** Section.*
*2) Answers to these Sections should be written in **separate** books.*
*3) Neat diagrams must be drawn **whenever** necessary.*
*4) Figures to the **right** indicate **full** marks.*
*5) Assume suitable data **if necessary**.*
6) Attempt Q. 1 OR Q. 2, Q. 3 OR Q. 4, Q. 5 OR Q. 6 from Section 1. Attempt Q. 7 OR Q. 8, Q. 9 OR Q. 10, Q. 11 OR Q. 12 from Section 2.

SECTION – I

1. A) What do you mean by Programming Language, Programming Paradigm and Programming Concept ? With suitable diagram demonstrate the relationship between them.   6

   B) Explain following properties of Programming Paradigms.   6
      1) Observable Non-determinism
      2) Named State

   C) Define the following terms :   6
      1) Record
      2) Lexically Scoped Closure
      3) Component
      4) Module
      5) Data Abstraction
      6) Abstract Data Type

                            OR

2. A) What do you mean by Independence (Concurrency) ? What are three levels of Concurrency ? Compare Concurrency with Parallelism.   8

   B) What is significance of Dynamic type Checking ? What are advantages and Disadvantages of Dynamic type Checking ?   6

   C) What are design issues for Counter Controlled loop statements ?   4

3. A) What is access function for an array ? How's storing of multidimensional arrays take place ? Develop row major access function for two-dimensional arrays. **8**

   B) When would you use a parameter that is a pointer ? When would you use a parameter that is a reference ? Explain Advantages and Disadvantages of each. **8**

   OR

4. A) Explain following terms with suitable examples. **8**
      1) Exception and Exception handler.
      2) Raising an Exception
      3) Build in Exception

   B) With suitable examples, Explain the significance of following terms related to Variable. **8**
      1) Lifetime
      2) Scope
      3) Static Scope
      4) Dynamic Scope

5. A) What are various stages of program execution written in procedural language ? Explain in brief. **6**

   B) Explain Characteristics of Procedural programming paradigm. **6**

   C) Write a short note on Block Oriented structured programming. **4**

   OR

6. A) What are Dangling pointers ? Why these pointers are dangerous ? Explain sequence of operations creating Dangling reference. **6**

   B) What is Variant Record ? Explain how Variant records are implemented in C and PASCAL. **6**

   C) Explain various Data types of PASCAL. **4**

SECTION – 2

7. A) With respect to JAVA, What is use of string buffer over string ? **4**

   B) What is use of following JAVA methods ? **4**
   1) indexOf (String S, int i)
   2) toCharArray( )

   C) How to create our own exception handling mechanism in JAVA ? **4**

   D) What do you mean by Garbage Collection ? Why it is important ? **4**

   ## OR

8. A) What are fundamental differences between value types and reference types with respect to C# ? **4**

   B) Specify significant difference between C# constructors and C+ + Constructors. **4**

   C) Explain following Object Oriented concepts of .NET framework Class Object with suitable Examples. **8**
   1) Finalizers
   2) IDisposable
   3) Delegates
   4) Events

9. A) Consider following PROLOG Database : **8**

Likes_to_eat (Cat, Fish)	Likes_to_eat (Cat, Mouse)
Likes_to_eat (Cat, Butter)	Likes_to_eat (Dog, Roti)
Likes_to_eat (Dog, Fish)	Likes_to_eat (Horse, Grass)
Likes_to_eat (Cow, Grass)	Likes_to_eat (Cow, Roti)

   What is the result in each of the following cases ?
   1) Goal : Likes_to_eat (Cow, X) and Likes_to_eat (Dog, X)
   2) Goal : Likes_to_eat (Cow, X) and Likes_to_eat (Y, X)
   3) Specify the Goal to list all animals who Likes_to_eat Roti
   4) Specify the Goal to list other likings of animals who Likes_to_eat Fish

B) With suitable Examples, explain following terminologies in PROLOG
1) Facts
2) Rules
3) Queries
4) Cuts.   8

OR

10. A) Explain the data types and operations supported by following Prolog Data types.   8
1) Atoms
2) Variables
3) Numbers

B) What is difference between Instantiation, Matching and Unification ?   8

11. A) Write short note on Free and Bound identifiers support with respect to Lambda Calculus.   6

B) Write a program for following vector operations :   8
1) Addition of two Vectors
2) Multiply Vector by Scalar
3) Display a Vector

C) State and explain key features and design goals of LISP.   4

OR

12. A) Consider List Two Lists :   4

$X = (a\ b\ c\ d\ e)$ $Y =$ Reverse of X

Write output of following :
1) (cadddr X)
2) (nth 2 (cdr X))
3) (append Y X)
4) (length (append X (nth 2(cdr X))))

B) Explain Shallow Binding and Deep Binding with respect to LISP.   6

C) Explain Innermost and Outermost expression evaluation techniques with suitable examples.   8