(i) Printed Pages : 4 Roll No. .....

(ii) Questions : 7 Sub. Code : 6 8 1 4

Exam. Code : 9 1 7

B.Engg. (Computer Science & Engg.) 5th Semester

1125

PRINCIPLES OF PROGRAMMING LANGUAGES

Paper : CSE–504/514

Time Allowed : Three Hours] **[Maximum Marks : 50**

Note :– Attempt **five** questions in all, including Q. No. 1 which is compulsory. Selecting **two** questions each from Sections A and B.

1. (a) What do you mean by scope and life time of variable ? Why are they important ?

(b) What is the purpose of Guarded Statements ?

(c) What advantages do monitors have over semaphores ?

(d) Explain difference between structured and non structured data types.

(e) Explain Dangling Pointers. Why does pointers are dangerous ?

(f) Give a regular expression for binary string that ends in 01.

(g) What determines whether an object has been allocated statically, on the stack or in heap ?

VI. a) How inheritance's implemented in C++? Explain.
b) Define function. How Higher-order functions are defined and implemented in functional programming? (5,5)

VII. a) How 'Type checking' and 'Type inference' is carried out in functional

(h) Do you think concurrent programming is a good idea? or why not ?

(i) What is the difference between Type Conversion and Coercion ?

(j) Define Subprogram. 1×10=10

SECTION–A

2. Design a class named Pizza. Data fields include a string field for toppings (such as pepperoni), numeric fields for diameter in inches (such as 12), and price (such as 13.99) :

(a) Write pseudo-code that defines class together with appropriate methods and attributes. 3

(b) Design an application that declares two Pizza objects and sets and displays their values. 3

(c) Design an application that declares an array of 10 Pizzas. Prompt user for data for each of the Pizzas, and then display all values including price or some additional offers to which customer is entitled on making bulk order that might help restaurant to raise sale of Pizzas. 4

3. (a) What is a compiler ? List phases that constitute front end and back end of a compilation process elaborating on output of each phase. 6

(b) Explain difference between functional, declarative and imperative programming with the help of example. 4

4. (a) Define Logic Programming. What features of PROLOG classify it as a logic programming language ? Explain the resolution principle of propositions using an example. 5

(b) A district has two high schools—S1 and S2. Each school maintains a student file with fields containing student ID, last name, first name and address. Each file is in student ID number order. Design logic for program that merges the two files into one file containing a list of all students in the district, maintaining student ID number order. 5

SECTION–B

5. (a) What is Type Inference ? Describe three contexts in which it occurs. Under what circumstances a type conversion does requires a run time check. 5

(b) Define Parametric Polymorphism. Write a polymorphic swap function that swap values of two variables of same type in C++. 5

6. What are Activation Records ? How activation records help in recursion ? Explain with help of recursive program to calculate Fibonacci sequence. The values of various variables (local and global) shall be depicted with suitable illustrations. You can assume language of your choice. 10

[Turn over

b) Define function. How Higher-order functions are implemented in functional programming?

VII. a) How 'Type checking' and 'Type inference' is carried out i programming?

important characteristics of "Prolog" with

7. (a) Explain heap storage management with :

(i) Fixed Size Storage

(ii) Variable size storage.

(b) What is type checking and what is its purpose ? Explain wi examples.

Exam. Code: 917
Sub. Code: 6813

1124

B. E./B.E. MBA (Computer Science and Engineering)
5th Semester
CSE-514: Principles of Programming Languages

Time Allowed: 3 hours Max. Marks: 50

Note: Attempt five questions in all ,including Question No. I which is compulsory, selecting at least two questions from each Unit I and II.

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I. Explain:
a) Grammar
b) Types of classes.
c) Cuts
d) Programming language
e) First class object
f) Type Inference
g) Java
h) C++
i) Polymorphism
j) Backtracking (10x1)

UNIT-I

II. a) Define Translation model. Explain its important functioning areas through any suitable example.
b) What is the difference between procedures and modules? Explain in respect of imperative programming. (5,5)

III. a) Explain the difference between object-oriented and logic programming.
b) Explain various data-types supported through imperative programming. Explain through examples. (5,5)

IV. a) How abstraction and encapsulation is implemented in object oriented programming? Explain.
b) How synchronization is important in concurrent programming? Explain various primitives. (5,5)

UNIT-II

V. a) Explain various salient features of functional programming in detail.
b) Explain any two Storage Management Techniques in brief. (5,5)

VI. a) How inheritance's implemented in C++? Explain.
b) Define function. How Higher-order functions are defined and implemented in functional programming? (5,5)

VII. a) How 'Type checking' and 'Type inference' is carried out in functional programming?
b) Explain various important characteristics of "Prolog" with examples. (5,5)

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(6813)

Exam.Code:0917
Sub. Code: **6789**

1127

B.E. (Computer Science and Engineering)

Fifth Semester

CS-504: Principles of Programming Languages

Time allowed: 3 Hours Max. Marks: 50

***NOTE**: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.*

x-x-x

1. Briefly explain the following:
   (a) Binding
   (b) Type Checking
   (c) Garbage Collection
   (d) Abstract Classes
   (e) Higher Order Functions **(5x2=10)**

Section-A

2. (a) Explain in detail different stages in language translation. (5)
   (b) Discuss different parameter passing mechanisms in detail. (5)
3. (a) Explain abstraction and encapsulation with the help of suitable example. (5)
   (b) What do you understand by Scope, Visibility and Lifetime of a variable? (5)
4. (a) What do you understand by logic programming? Explain it with respect to relation, rules, facts and queries. (5)
   (b) What is Concurrency? Discuss various categories of Concurrency. (5)

Section-B

5. Explain briefly:
   (a) Static storage management
   (b) Heap based storage management (5,5)
6. (a) How functions are declared in functional programming language? (5)
   (c) Explain the rules for expression evaluation in functional programming. (5)
7. (a) What are exceptions? How are they handled in Java? (5)
   (b) Compare C++ and Java threads. (5)

x-x-x

Exam.Code:0917
Sub. Code: 6789

1128

B.E. (Computer Science and Engineering)
Fifth Semester
CS-504: Principles of Programming Languages

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit. Assume missing data if any suitably.

x-x-x

I. Write short note on:-
a) Abstraction
b) BNF Grammars
c) Virtual functions and classes
d) Type Checking in C++
e) Heap Storage Management (5x2)

UNIT – I

II. a) Discuss the various phases of compiler with block diagram.
b) What is shared data problem? Explain your idea for solving shared data problem. (5,5)

III. a) Differentiate between call by value and call by reference parameter passing mechanism with the help of suitable example.
b) Explain the various programming language paradigms. (5,5)

IV. a) Explain public and private inheritance.
b) What do you mean by monitor? How synchronization is achieved using monitors? (5,5)

UNIT – II

V. a) What is an abstraction in object oriented programming and why is it important?
b) What is an abstract class, and when should it be used? (5,5)

VI. a) Explain how polymorphic data types help to implement the parametric polymorphism?
b) Explain the concept of inheritance and its types with suitable example of each of them. (5,5)

VII. a) How heap storage management is done in C++ and Prolog programming language?
b) What do you mean by Garbage collection? Explain various ways of reclaiming garbage? (5,5)

x-x-x