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Question Paper Code : 30543

M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022

First Semester

Computer Science and Engineering

CP 4154 – PRINCIPLES OF PROGRAMMING LANGUAGES

(Common to : M.E. Computer Science and Engineering (With Specialization in Artificial Intelligence and Machine Learning)

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Justify the statement "Understanding the concepts of programming languages helps to choose appropriate language for applications"

2. Illustrate the operators in C that are designed similar to the operators in ALGOL68 with examples.

3. Distinguish between Static scope and Dynamic scope.

4. Convert the following expression into prefix and postfix expressions. A*(B^(C+D)/(E–F)+G)*H/I–J.

5. Mention the implementation models of parameter passing.

6. Provide an example for user defined overloaded function in Java.

7. Draw the flow diagram of different states of a Task.

8. Write a C++ program to illustrate the use of 'this' pointer.

9. List any four numeric functions in Scheme.

10. When the prepositions are said to be Horn clauses? Give an example.

PART B — (5 × 13 = 65 marks)

11. (a) How Left recursion affects the Recursive-Decent parser? Illustrate Recursive-decent parsing with an example and necessary parse tree representation. (13)

Or

(b) Define Attribute Grammar. Generate the fully attributed parse tree for the assignment statement B = C * D – E. (13)

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12. (a) Discuss in detail about the operations and implementation of Array, List, Tuple and Pointers and References data types with suitable examples for each.

Or

(b) Explain overloaded operators and type conversion each with an example.

13. (a) How the stacks are used in recursive subprograms? Explain with an example. How is it different from simple Call-Return subprograms?

Or

(b) What do you mean by block structure? How the concepts namely 'static scope' and 'dynamic scope' are related with block structure?

14. (a) How the different types of semaphores help to synchronize the tasks? Explain. In what way the monitors are different from semaphores?

Or

(b) How the exceptions are handled in C++? Explain with suitable examples.

15. (a) Compare the functional features of LISP, Scheme and ML. Provide necessary examples.

Or

(b) Discuss about Predicate calculus. How are they used to prove the theorems? Explain with proper examples.

PART C — (1 × 15 = 15 marks)

16. (a) Describe Hybrid Inheritance in Java. Write an example program that implements the hybrid inheritance in Java.

Or

(b) Design a function retriv[list; i] which returns the ith value in the list in Prolog and Lisp. Use the above function to search for a given key in a list of numbers and also to find the number of occurrences of the key in the list.

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