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Name.....

Reg. No.....

FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2K SCHEME) EXAMINATION, MARCH 2013

IT 2K 404 – PROGRAMMING LANGUAGE CONCEPTS

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

I. 1. Draw abstract syntax trees for the expressions :

(a) $x * y + z$.

(b) $(x + y) * z$.

(c) $p * Q + r * s$.

(d) sqrt $(b * b - 4 * a * c)$.

(e) $(a / b) + (c * d)$.

2. Write about design principles for imperative languages.

3. Explain nested procedures with example.

4. Differentiate call by value and call by reference in object oriented programming.

5. What is a pattern? Explain about patter and case analysis.

6. Explain how to write an expression.

7. Explain negation as failure in Prolog with example.

8. Discuss about interleaving of threads.

(8 × 5 = 40 marks)

II. (a) Write notes on expression notations.

Or

(b) Develop a program to find the k^{th} occurrence of x, from left to right, $k \geq 0$, in a subarray A $[i \ldots n]$.

(1 × 15 = 15 marks)

III. (a) Design a program that uses an auxiliary stack to evaluate postfix expressions.

Or

(b) Explain object-oriented programming in C++.

(1 × 15 = 15 marks)

Turn over

IV. (a) Describe ML expressions.

Or

(b) Write notes on list elements and operations on lists.

(1 × 15 = 15 marks)

V. (a) Discuss about data structure in Prolog.

Or

(b) Brief on liveness properties.

(1 × 15 = 15 marks)

[4 × 15 = 60 marks]