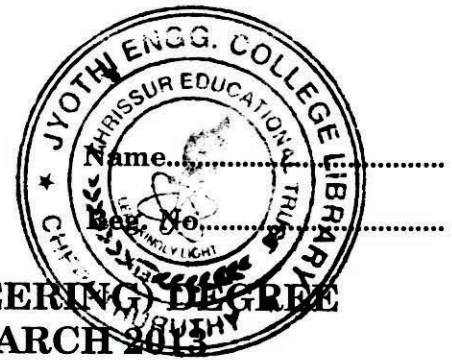


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**FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE
(2K SCHEME) EXAMINATION, MARCH 2013**

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) $\text{sqrt}(b * b - 4 * a * c).$
- (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 patten 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 $A [i \dots n]$.

(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]