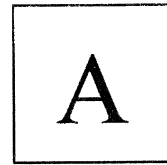


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## ***B.Tech. Degree III Semester Examination November 2017***

### **CS 15-1305 PRINCIPLES OF PROGRAMMING LANGUAGES (2015 Scheme)**

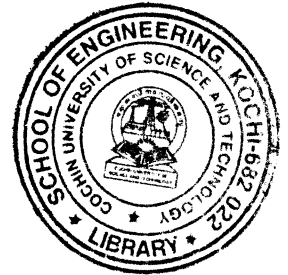
Time : 3 Hours

Maximum Marks : 60

#### **PART A** (Answer *ALL* questions)

(10 × 2 = 20)

- I. (a) Write a grammar for the language consisting of strings that have n copies of the letter a followed by the same number of copies of the letter b, where n>0.  
(For example, the strings ab, aaaabbbb, and aaaaaaabbabbbb are in the language but a, abb, ba, and aaabb are not.)
- (b) What does it mean for a program to be reliable?
- (c) Describe the basic concept of denotational semantics.
- (d) In what way are reserved words better than keywords?
- (e) Define static binding and dynamic binding.
- (f) Distinguish between static ancestor and dynamic ancestor of a subprogram.
- (g) Explain co-routines.
- (h) What are the two kinds of abstractions in programming languages?
- (i) What are the differences between CAR and CDR?
- (j) If CONS is called with two atoms, say 'A and 'B, what is the returned?



#### **PART B**

(4 × 10 = 40)

- II. Explain with an example about ambiguous grammar. (10)
- OR**
- III. Define syntax of a programming language. Discuss the formal methods of describing syntax. (10)
- IV. Describe the scope and lifetime of a variable. (10)
- OR**
- V. Explain various methods of parameter passing to subprograms with examples. (10)
- VI. (a) Write a short note about Encapsulation. (3)  
(b) Describe the features of smalltalk. (7)
- OR**
- VII. Explain various design issues associated with object oriented languages. (10)
- VIII. (a) Write short note on Lamda Calculus. (5)  
(b) Explain the use of Horn clauses. (5)
- OR**
- IX. (a) Describe the inferencing process of PROLOG. (5)  
(b) Describe the applications of logic programming. (5)