Printed pages:2 **Sub Code: NCS-503**

Paper ID:1038 **Roll No.** | | | | | | | | | | |

B.TECH.
(SEM-V) THEORY EXAMINATION 2017-18
PRINCIPLES OF PROGRAMMING LANGUAGES

TIME: 3 Hours **TOTAL MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION- A

1. Attempt *all* questions in brief: **2X10=20**

(a) How does the programming environment influence the language design?
(b) Explain the term language semantics.
(c) Explain the public, private and protected access specifiers.
(d) Define bootstrapping.
(e) Discuss the need of language translators.
(f) Differentiate between compiler and interpreter.
(g) What is an inline function?
(h) Write down the different properties of a constructor.
(i) Define a procedure in LISP to calculate cube of a number.
(j) What is an abstract data type?

SECTION-B

2. Note: Attempt any *three* of the following: **10X3=30**

(a) Explain the structure or phases of a compiler.
(b) Explain the facts and rules in Prolog with suitable example.
(c) Explain different ways of storage representation of data structure.
(d) What are the general syntactic criteria of a programming language?
(e) What are the various fields of an activation record? Explain how activation record looks like for every recursive call in case of factorial. Also draw activation tree for the same.

SECTION-C

3. Attempt any *one* part of the following: **10X1=10**

(a) What is lambda calculus? Write a note on free and bound variables in lambda calculus.
(b) Explain the concept of inheritance and its types with suitable example of each of them.

4. Attempt any *one* part of the following: **10X1=10**

(a) Describe subprogram control and its types in detail with the help of an example of each of them.
(b) Explain the various programming language paradigms.

5. Attempt any *one* part of the following: **10X1=10**

(a) Differentiate between call by value and call by reference parameter passing mechanism with the

help of suitable example.

(b) Explain the structure of List used in LISP. Also discuss the commonly used list manipulation functions.

6. Attempt any *one* part of the following: 10X1=10

(a) Describe sequence control in various statements with suitable examples.

(b) Write a Recursive Lisp function to find largest number from a given list.

7. Attempt any *one* part of the following: 10X1=10

(a) Explain the concept of subtyping with suitable example. Also explain the properties of subtyping.

(b) Write short note on-

(i) Variables, constants and literals for a language.

(ii) Compare C, C++ and LISP on the basis of various attributes.