

**B. Tech**  
**(SEM V) THEORY EXAMINATION 2018-19**  
**PRINCIPLES OF PROGRAMMING LANGUAGES**

*Time: 3 Hours**Total Marks: 70***Note: 1.** Attempt all Sections.

**SECTION A**

- 1. Attempt *all* questions in brief. **2 x 7 = 14****
- a. Differentiate between Error and Exception.
  - b. Define Class and Object briefly.
  - c. Enlist the different times at which Binding can take place.
  - d. Describe Aliasing for Data Objects with an example.
  - e. Differentiate between Widening and Narrowing conversion.
  - f. Define co-routines.
  - g. Write a function in ML to find the maximum of two numbers.

**SECTION B**

- 2. Attempt any *three* of the following: **7 x 3 = 21****
- a. Describe basic syntactic elements of a language.
  - b. List and describe the various mechanisms for storage representation of Structured Data types. Also describe the various specifications of Structures Data types.
  - c. Describe Overloaded Methods and Generic Method in detail along with the examples.
  - d. Discuss about Semaphores and Monitors.
  - e. Describe facts and rules in Prolog with examples. Write a program that describes relationships of the members in a family.

**SECTION C**

- 3. Attempt any *one* part of the following: **7 x 1 = 7****
- (a) Explain the various programming language paradigms.
  - (b) Describe the structure or the different phases of a compiler.
- 4. Attempt any *one* part of the following: **7 x 1 = 7****
- (a) Using suitable examples, illustrate the difference between:
    - 1) Static and Dynamic Type Checking
    - 2) Implicit and Explicit Type Conversion
  - (b) How a pointer can be useful for programmers. Also define Dangling pointer and void pointer with examples.
- 5. Attempt any *one* part of the following: **7 x 1 = 7****
- (a) Illustrate the different parameter passing techniques along with the example of each technique. Using an example, show the difference between call by reference and call by Value-result.

- (b) Describe Associations and Referencing Environment. Explain the different components of Referencing Environment. With respect to the given program, write down the Referencing Environment for S1 and main.

```
program main;  
var A, B, C: real;  
procedure S1(A : real);  
var D: real;  
begin  
-Statements  
-Statements  
end;  
begin  
-Statements  
S1(A);  
-Statements  
end;
```

**6. Attempt any one part of the following:**

**7 x 1 = 7**

- (a) Define Abstract classes and Abstract methods with example. Differentiate between Abstraction and Encapsulation.
- (b) Describe Inheritance and its types with suitable examples of each type.

**7. Attempt any one part of the following:**

**7 x 1 = 7**

- (a) Describe Functional Programming languages. Write a recursive function in SML to find the sum of digits of a number.
- (b) Explain Lambda Calculus. Explain the different reductions possible for evaluating a lambda calculus. Reduce  $(\lambda f. \lambda x. f (f x)) (\lambda y. y+1)$  to its normal form.