II B.TECH - II SEMESTER EXAMINATIONS, APRIL/MAY, 2011
PRINCIPLES OF PROGRAMMING LANGUAGES
(INFORMATION TECHNOLOGY)

Time: 3hours   Max. Marks: 75

Answer any FIVE questions
All Questions Carry Equal Marks

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1.   How can knowledge of programming language characteristics benefits the whole computing Community?   [15]

2.a)   The two mathematical models of language description are generation and recognition. Describe how each can define the syntax of a programming language?
  b)   Develop an unambiguous grammar that describes the *if* statement.   [8+7]

3.a)   Explain all of the difference between subtypes and derived types.
  b)   Define union, free union and discriminated union?   [8+7]

4.a)   How does operand evaluation order interact with functional side effect ?
  b)   How does operand evaluation order interact with function side effects?   [8+7]

5.a)   Define Shallow and Deep binding for referencing environment of subprograms that Have been passed as parameters.
  b)   Write about Co routines.   [8+7]

6.a)   In what different places can the definition of a C++ member function appears?
  b)   What is a C++ namespace and what is its purpose?   [8+7]

7.   Explain the following with examples
      a) Exception Handler
      b) Disabling an exception
      c) Continuation
      d) Built-in Exception.   [15]

8.a)   What are the difference between CONS, LIST and APPENED?
  b)   Write a LISP function Fib(n) that computes nth Fibonacci number.   [7+8]

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1.   What are some features of specific programming languages you know whose rationales
      are a mystery to you?   [15]

2.   Write a BNF description of the Boolean expressions of Java, including the three operators
      &&, || and ! and the relational expressions?   [15]

3.a) What are the design issues for character string types?
  b) What array initialization feature is available in Ada that is not available in other common
      imperative languages?   [7+8]

4.   Write text program in c++, java and c# to determine the scope of a variable declared in a
      for statement. Specifically the code must determine whether such variable is visible after
      the body of the for statement.   [15]

5.a) What are the different models of parameter passing methods? How are they
      implemented? Give example for each.
  b) What causes a C++ template function to be instantiated?   [8+7]

6.   Write an analysis of the similarities of and differences between java packages and C++
      namespaces?   [15]

7.   What run-time errors or conditions, if any, an Pascal programs detect and handle?   [15]

8.   What scoping rule is used in
      a) COMMON LISP
      b) ML
      c) Haskell.   [15]

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1.   Many languages distinguish between UPPER CASE and LOWER CASE letters in user-defined   names. What are the pros and cons of this design decision?   [15]

2.a)   Describe the basic concept of denotational semantics?
   b)   What is the difference between synthesized and inherited attributes?   [7+8]

3.   What are all of the differences between the enumeration types of C++ and those of java? How does a decimal value waste memory space?   [15]

4.   Determine whether the narrowing explicit type conversions in two languages you know provide errors messages when a converted value loses its usefulness?   [15]

5.   What are the modes, the conceptual models of transfer, the advantages and disadvantages of pass – by – value, pass – by – result, pass – by – value - result and pass – by - reference parameter- passing methods?   [15]

6.a)   What are the language design issues for abstract data types?
   b)   What are the disadvantages of designing an abstract data type to be a pointer?   [7+8]

7.   Write detailed compassion of the Exception Handling capabilities of C++ and those of JAVA?   [15]

8.   Define functional form and referential transparency? What data types were parts of the original LISP?   [15]

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1.   Which produces faster Program execution, a Compiler (or) pure interpreter? What role does the symbol table play in a compiler?   [15]

2.a) Describe the approach of using axiomatic semantics to convert the correctness of a given program?
  b) Convert the following EBNF to BNF
        S->A{bA}
        A-> a[b]A   [7+8]

3.   What is the purpose of the ACTION, GOTO table of an LR parser? Explain With Example?   [15]

4.   Write text program in c++, java and c# to determine the scope of a variable declared in a for statement. Specifically the code must determine whether such variable is visible after the body of the for statement.   [15]

5.   Define static, fixed stack-dynamic, fixed heap-dynamic and heap-dynamic array. What are the advantages of each?   [15]

6.a) What is the primary problem with using semaphores to provide synchronization?
  b) Explain the difference between physical and logical concurrency?   [8+7]

7.   What is root class of all java exception classes? What is pattern class of most java user defined exception classes?   [15]

8.a) Write a detail note on functions in ML.
  b) Give comparison of Functional and Imperative Languages.   [7+8]

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