Code No: R09221201 | R09 | SET-1

B.Tech II Year - II Semester Examinations, April-May, 2012
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information Technology)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1.a) Discuss the general methods of implementing a programming language.
b) Many languages distinguish between uppercase 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. In what way do operational semantics and denotational semantics differ?
b) 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. [15]

3.a) Describe the design issues for pointer types? Why are pointers of most languages restricted to pointing at a single type variable?
b) Define name type compatibility and structure type compatibility. What are the relative merits of these two? [15]

4.a) What are pretest and posttest loop statements? Describe the design issues of counter-controlled loop statements.
b) Should an optimizing compiler for C or C++ be allowed to change the order of sub expressions in a Boolean expression? Justify. [15]

5.a) Describe the design issues for functions.
b) In what ways are co-routines different from conventional subprograms? Explain with suitable examples. [15]

6.a) What are the language design requirements for a language that supports abstract data types?
b) Explain how Smalltalk messages are bound to methods. When does this take place? [15]

7.a) How van exception handler is written in C++ so that it handles any exception? Explain with examples.
b) Explain how backtracking works in Prolog with suitable example. [15]

8.a) What are the ways in which ML is significantly different from Scheme?
b) Write a Scheme function that takes a simple list of numbers as its parameters and returns the list with the numbers in ascending order. [15]

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Code No: R09221201 | R09 | SET-2

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PRINCIPLES OF PROGRAMMING LANGUAGES
(Information Technology)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Why is it useful for a programmer to have some background in language design, even though he or she may never actually design a programming language?
b) Explain the role of symbol table in a compiler with suitable example. [15]

2.a) Describe the approach of using axiomatic semantics to prove the correctness of a program.
b) List the differences between an intrinsic attribute and a non-intrinsic synthesized attribute. [15]

3.a) What is the purpose of level numbers in COBOL records?
b) What is the general problem with static scoping? How is a reference to a non local variable in a static scoped program connected to its definition?
c) What happens when a non existent element of an array is referenced in Perl? [15]

4.a) Discuss the design issues of multiple- selection statements and logically controlled loop statements.
b) Briefly explain about the mixed – mode assignments that are allowed in Ada and Java languages. [15]

5.a) Discuss the issues that arise when subprogram names are parameters.
b) In what ways can aliases occur with pass-by-reference parameters? [15]

6.a) Explain how information hiding is provided in Ada package?
b) How is a call to a subprogram in Ada 95 specified to be dynamically bound to a subprogram definition? When is this decision made? [15]

7.a) What are the possible frames of exceptions in Ada? How can an exception be explicitly raised in Ada?
b) What are the syntactic forms and usage of fact and rule statements in Prolog? [15]

8.a) Write a Scheme function that takes a simple list of numbers as its parameters and returns the largest and smallest numbers in the list.
b) Describe the syntax and semantics of COND and LET. [15]

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Code No: R09221201 | R09 | SET-3

B.Tech II Year - II Semester Examinations, April-May, 2012
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information Technology)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1.a) How can knowledge of programming language characteristics benefit the whole computing community?
b) List the differences between interpreter and pure interpreter and also explain the advantages in implementing a language with a pure interpreter. [15]

2.a) What is the primary use of attribute grammars? How is the order of evaluation of attributes determined for the trees of a given attribute grammar?
b) Write a BNF description of the Boolean expressions of Java, including the three operators &&, ||, ! and the relational expressions. [15]

3.a) In what ways are the user-defined enumeration types of C# more reliable than those of C++?
b) Dynamic type binding is closely related to implicit heap – dynamic variables. Explain this relation ship. [15]

4.a) What advantages does Java's break statement have over C's and C++'s break statements?
b) Why does java specify that operands in expressions are all evaluated in left-to-right order? [15]

5.a) Define shallow and deep binding for referencing environments of subprograms that have been passed as parameters.
b) Give the general characteristics and design issues of subprograms. [15]

6.a) What are friend functions and friend classes? Give the reasons that Java does not have friend functions or friend classes.
b) Describe the five different states in which a task can be. [15]

7.a) What is the difference between checked and unchecked exceptions in Java? Can you disable a Java Exception? How?
b) Explain the generate – and – test programming strategy in Prolog. [15]

8.a) What are the differences between CONS, LIST and APPEND.
b) Write a Scheme function that removes the last element from a given list. [15]

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Code No: R09221201 | R09 | SET-4

B.Tech II Year - II Semester Examinations, April-May, 2012
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information Technology)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1.a) Briefly explain the features of various programming languages whose structure is dictated by the von Neumann computer architecture.
b) How is the cost of compilers for a given language related to the design of that language?
c) Why is type checking the parameters of a subprogram important? [15]

2.a) Describe the operations of general language generator and general language recognizer.
b) Describe how each of the two mathematical models of language description, define the syntax of a programming language. [15]

3.a) How does a decimal value waste memory space? Explain with an example.
b) What is the difference between an Ada derived type and an Ada subtype? [15]

4.a) Explain the advantages and disadvantages of the Java For statement compared o Ada's for.
b) How does operand evaluation order interact with functional side effects? What is short circuit evaluation? [15]

5.a) Briefly discuss about the semantic models of parameter passing.
b) What are formal and actual parameters? Discuss the advantages and disadvantages of keyword parameters. [15]

6.a) Describe the fundamental differences between C# structs and its classes.
b) Discuss the primary problems with using semaphores to provide synchronization. [15]

7.a) What are the differences between a C++ throw specification and a Java throws clause?
b) Explain the connection between automatic theorem proving and Prolog's inferencing process. [15]

8.a) What are the differences between the evaluation method used for the Scheme special form DEFINE and that used for its primitive functions.
b) Write a Scheme function that returns the number of zeros in a given simple list of numbers. [15]

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