

Code No: 09A50501

R09

SET-1

B. Tech III Year I Semester Examinations, December-2011
PRINCIPLES OF PROGRAMMING LANGUAGES
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain in detail about various language evaluation criteria and the characteristics that affect them.
- b) Explain the process of compilation. [7+8]
- 2.a) Distinguish between language generators and language recognizers.
- b) Give grammar for simple assignment statements.
- c) Give an unambiguous grammar for if-then-else. [15]
- 3.a) What do you mean by axiomatic semantics? Give the weakest precondition for a sequence of statements.
- b) Explain about stack dynamic variables and explicit heap dynamic variables. [7+8]
- 4.a) Explain about subscript bindings and various array categories.
- b) Explain about heap management of a single size and variable size segments. [7+8]
- 5.a) What do you mean by type coercion?
- b) Explain about iteration based on data structures.
- c) What are guarded commands? [15]
- 6.a) Explain about generic sub programs.
- b) Explain how various implementation models of parameter passing are actually implemented. [7+8]
- 7.a) Explain about parameterized abstract data types with an example in C++.
- b) Explain in detail about monitors. [7+8]
- 8.a) Discuss about exception handling in C++.
- b) Give applications of logic programming. [7+8]

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SET-2

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Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain about various programming domains.
- b) What are the factors that influence the basic design of programming languages? [7+8]
- 2.a) Give BNF and EBNF versions of an expression grammar.
- b) Explain about attribute grammars in detail. [7+8]
- 3.a) What do you mean by denotational semantic? Give denotational semantics of a simple logical loop.
- b) Distinguish between static scoping and dynamic scoping with an example.[7+8]
- 4.a) Explain about user defined ordinal types.
- b) What are the primary design issues particular to pointers? [7+8]
- 5.a) What do you mean by a functional side-effect?
- b) What are the design issues of multiple selection constructs? [7+8]
- 6.a) Explain about different semantics models of parameter passing and implementation models of parameter passing.
- b) Illustrate coroutines with example. [7+8]
- 7.a) Explain in detail about semaphores.
- b) Discuss about exception handling in Java. [7+8]
- 8.a) Explain about LISP.
- b) Discuss about basic elements of Prolog. [7+8]

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SET-3

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(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. Explain in detail about various language implementation methods. [15]
2. Compute the weakest precondition for each of the following assignment statements and post conditions:
a) $a=2*(b-1)-1 \{a>0\}$
b) $b=(c+10)/3 \{b>6\}$
c) $a=a+2*b-1 \{a>1\}$
d) $x=2*y+x-1 \{x>11\}$. [15]
- 3.a) What are the advantages and disadvantages of dynamic type binding?
b) Explain about associative arrays. [7+8]
- 4.a) Define narrowing and widening conversions.
b) What is a mixed mode expression?
c) What are the design issues for logically controlled loop statements? [15]
5. Explain about various implementation models of parameter passing. [15]
- 6.a) What are the language design requirements for a language that supports abstract data types?
b) Explain in detail about monitors. [7+8]
- 7.a) Explain in detail about exception handling in Ada.
b) What are the three features of Haskell that make it very different from Scheme?
c) What does lazy evaluation mean? [15]
8. Write short notes on the following.
a) Functional programming languages
b) Semaphores
c) Guarded commands. [15]

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SET-4

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PRINCIPLES OF PROGRAMMING LANGUAGES
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain about the factors that influence the language design.
- b) Explain about the process of compilation. [7+8]
- 2.a) Distinguish between general language generator and general language recognizer.
- b) Describe the basic concept of denotational semantics.
- c) What is the difference between a sentence and a sentential form? [15]
- 3.a) Distinguish between name type compatibility and structure type compatibility.
- b) Define static, fixed stack-dynamic, stack-dynamic, fixed heap-dynamic and heap-dynamic arrays. What are the advantages of each? [7+8]
- 4.a) What is a short-circuit evaluation?
- b) Define functional side effect. How does operand evaluation order interact with functional side effects?
- c) What are the design issues for selection structures? [15]
- 5.a) What are the three semantic models of parameter passing?
- b) Define shallow and deep binding for referencing environments of subprograms that have been passed as parameters. [7+8]
- 6.a) What are the language design issues for abstract data types?
- b) What is a binary semaphore? What is a counting semaphore? What are the primary problems with using semaphores to provide synchronization? [7+8]
- 7.a) Explain the basic concepts of exception handling? What are the design issues for exception handling systems?
- b) Why were imperative features added to most dialects of LISP? [7+8]
8. Write short notes on the following.
 - a) Co-routines
 - b) Procedural abstraction
 - c) Data abstraction. [15]

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