Code :9A15403 1

II B.Tech II Semester(R09) Regular Examinations, April/May 2011
PRINCIPLES OF PROGRAMMING LANGUAGES
(Information technology)

Time: 3 hours Max Marks: 70

Answer any FIVE questions
questions carry equal marks
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1. Discuss briefl y languages evaluation criteria and the characteristics that aff ect them.
2. (a) Discuss the general problem of describing syntax.
   (b) Consider the grammar $E \rightarrow E + E$
   $E \rightarrow E * E$
   $E \rightarrow i$
   Using the expression 5+6*7, prove that the grammar is ambiguous.
3. (a) Explain the advantages and disadvantages of dynamic scoping.
   (b) What is a heterogeneous array? Discuss the design issues for arrays.
4. (a) Describe coercion in expressions.
   (b) Explain dijkstra' s guarded commands with example.
5. (a) Explain the general characteristics of subprograms.
   (b) What is a coroutime? How do they provide interleaved execution?
6. (a) What are the language design requirements for a language that supports abstract data types?
   (b) How is cooperation synchronization provided for Ada tasks? Explain.
7. (a) Discuss the fundamentals of functional programming language
   (b) Explain procedural abstraction in Pythan.
8. Explain exception handling in Java.

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1. Explain various programming domains. Give your arguments for and against having a single language for all programming domains.
2. (a) Describe the basic concept of denotational semantics.
   (b) Show a parse tree and leftmost derivation for the statement $A = (A + B) * C$ of the following grammar.

$$<assign> \rightarrow <id> = <expr>$$
$$<expr> \rightarrow <expr> + <term> / <term>$$
$$<term> \rightarrow <term> * <factor> / <factor>$$
$$<id> \rightarrow A/B/C$$
$$<factor> \rightarrow (<expr>) / <id>$$

3. (a) Discuss the advantages of name type compatibility and structure type compatibility.
   (b) Explain in detail implementation of pointer and reference types.
4. (a) Discuss the problem of operand evaluation order and side effects and provide solutions for this problem.
   (b) Explain user-located loop control mechanisms.
5. (a) What the three semantic models of parameter passing.
   (b) What is a parameter profile? What is a subprogram protocol?
6. (a) Compare the class entity access controls of C++ and Java.
   (b) What advantages do monitors have semaphores? Explain.
7. Explain list processing in LISP using schema function. Give illustrations.
8. What is an exception? Discuss about exception propagation and exception handling.

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1. (a) List the potential benefits of studying concepts of programming language.
   (b) What are the important factors that influence the basic design of programming language? Explain.
2. Discuss briefly formal language generation mechanisms used to describe the syntax of programming languages.
3. (a) Define coercion, type checking and strong typing.
   (b) Discuss the design issues for pointers types.
4. (a) Explain about mixed mode assignment.
   (b) "Every counting loop can be built with a logical loop, but the reverse is not true" Substantiate this statement.
5. Explain variety of models that guide the implementation of the three basic parameter transmission modes.
6. (a) Explain why naming encapsulation are important for developing large programs.
   (b) What is the purpose of a task-ready queue?
   (c) Define race condition.
7. Discuss how schema function are used to solve the problems in simple list-processing.
8. (a) Describe the basic elements of prolog.
   (b) Give a note on exception handles in Ada.

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1. (a) Discuss various types of implementation systems of programming languages.
   (b) Write short notes on programming environments.
2. (a) In what way do operational semantics and denotational semantics diff er? Explain.
   (b) Explain the additional features of extended BNF.
3. (a) Compare and contrast static binding with dynamic binding.
   (b) Explain various user-defi ned ordinal issues for arithmetic expressions.
4. Discuss the primary design issues for arithmetic expressions.
5. What is a generic subprogram? Explain the support provided by programming languages for generic sub programs.
6. (a) What dangers are avoided in java by having implicit garbage collection, relative in C++?
   (b) Discuss the primary reason for all java objects have a common ancestor.
   (c) What is a binary semaphore? What is a counting semaphore?
7. (a) Explain type inferencing in ML.
   (b) Discuss the key concepts of scripting languages.
8. Give an overview of logic programming and its applications.

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