Code No: R22056 **R10** SET - 1

II B. Tech II Semester, Regular Examinations, April/May – 2013
PRINCIPLES OF PROGRAMMIG LANGUAGE
(Com. to CSE, IT)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Why are there so many programming languages? Discuss in detail.
   b) Differentiate between interpretation and compilation. What are the comparative advantages and disadvantages of the two approaches? (5M+10M)

2. Explain the following with suitable example
   i) The notion of binding time
   ii) Object lifetime and storage management
   iii) Macro Expansion
   iv) Referencing environment (4M+4M+4M+3M)

3. Construct a syntax tree via decoration of a bottom-up parse tree, using the grammar
   E1 → E2 + T
   E1 → E2 - T
   E → T
   T1 → T2 * F
   T1→ T2 / F
   T → F
   F1→ - F2
   F → (E)
   F → const (15M)

4. a) List the principal uses of goto, and the structured alternatives to each.
   b) Explain the distinction between exceptions and multilevel returns.
   c) Explain why it may sometimes be useful for a function to have side effects (5M+5M+5M)

5. a) What purpose do data types serve in a programming language?
   b) What is the difference between discrete and scalar types?
   c) Give two examples of languages that lack a Boolean type. What do they use instead? (5M+5M+5M)

6. a) Describe four common parameter-passing modes. How does a programmer choose which one to use when?
   b) Describe the parameter modes of Ada. How do they differ from the modes of most other Algol-family languages? (8M+7M)

7. a) Name three important benefits of abstraction.
   b) Does a constructor allocate space for an object? Explain.
   c) What are private and limited private types in Ada? (5M+5M+5M)

8. a) Briefly describe the process of resolution in logic programming.
   b) What is unification? Why is it important in logic programming? (8M+7M)
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1. a) What are the reasons for studying Programming languages?
   b) What distinguishes declarative languages from imperative languages? (8M+7M)

2. a) What is meant by scope? Explain scope rules.
   b) What is meant by referencing environments? Describe the difference between deep and shallow binding of referencing environments (8M+7M)

3. a) What is the difference between syntax and semantics?
   b) What are associativity and precedence? Why are they significant in parse trees?
   c) What is meant by ambiguity? Give example. (5M+5M+5M)

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 (8M+7M)

5. a) What are records and variants? Explain the difference between them.
   b) Explain variants in Ada with suitable example. (9M+6M)

6. a) What are the purposes of the stack pointer and frame pointer registers? Why does a subroutine often need both?
   b) How do calling sequences typically differ in CISC and RISC compilers? (8M+7M)

7. a) Explain about the dynamic method binding with suitable example.
   b) Explain the difference between dynamic and static method .What is an abstract method? (8M+7M)

8. a) Explain how Prolog differs from imperative languages in its handling of arithmetic.
   b) Describe the difference between forward chaining and backward chaining. Which is used in Prolog by default?
   c) Describe the Prolog search strategy. Discuss backtracking and the instantiation of variables. (5M+5M+5M)
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1. a) Explain about programming environments. Give examples with explanation.
   b) Explain scanning and parsing in compiler (8M+7M)

2. a) Discuss about implementation of pointers and reference types.
   b) What are different times at which decisions may be bound? (9M+6M)

3. a) Explain the role of semantic analyzer.
   b) What are different types of attributes? Explain each with example. (8M+7M)

4. a) Explain iteration and recursion with example.
   b) What is a tail-recursive function? Why is tail recursion important? (7M+8M)

5. a) What do you meant by type systems? What does it consists and explains
   b) Explain variants in Ada with suitable example. (9M+6M)

6. a) What are the semantic models for parameter passing? Explain in detail.
   b) Discuss the primary problems with using semaphores to provide synchronization (8M+7M)

7. a) Summarize the fundamental arguments for dynamic method binding.
   b) Why do C++ and C# use static method binding by default? Explain (8M+7M)

8. a) What are the functional forms provided by LISP?
   b) Describe Predicate functions for symbolic atoms and list. (8M+7M)
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Code No: R22056 **R10** SET - 4

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Time: 3 hours Max. Marks: 75

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1. a) Describe the approach of using axiomatic semantics to prove the correctness of a given program.
   b) What is Backus-Naur form? Explain in brief. (8M+7M)

2. a) What is meant by scope? Explain scope rules.
   b) Explain the implementation of dynamic scope with example (8M+7M)

3. a) What is primary use of attribute grammars? How is the order of evaluation of attributes determined for the trees of a given attribute of grammar?
   b) Write the grammar for language consisting of strings that have a n copies of the letter a followed by the same number of copies of the letter b ,where n>0 (8M+7M)

4. a) How does operand evaluation order interact with functional side effect?
   b) How does C support Relational and Boolean expressions?
   c) What mixed-mode assignments are allowed in Ada? (5M+5M+5M)

5. a) What are records and variants? Explain the difference between them.
   b) Explain variants in Ada with suitable example. (8M+7M)

6. a) Describe the algorithm used to identify an appropriate handler when an exception is raised in a language like Ada or C++.
   b) Explain why it is useful to define exceptions as classes in C++, Java, and C#.
   c) How do the exception handlers of a functional language like ML differ from those of an imperative language like C++? (5M+5M+5M)

7. a) Explain the principles of object-oriented languages in detail
   b) Why do C++ and C# use static method binding by default? Explain (8M+7M)

8. What are the features provided by the functional languages over imperative languages? Explain each with suitable example. (15M)
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