

**ST. ANN'S COLLEGE OF ENGINEERING & TECHNOLOGY: CHIRALA**  
**DEPARTMENT OF COMPUTERS SCIENCE & ENGINEERING**

**SUBJECT: Principles of Programming Languages**

**ACADEMIC YEAR: 2017-18**

**YEAR & SEM/SECTION: II-II**

**ASSIGNMENTS**

**UNIT-I**

- 1.a) What is the difference between syntax & semantics?
  - b) What are associativity and precedence? Why are they significant in parse trees?
  - c) What is meant by ambiguity? Give example.
  
2. Consider the grammar
  - $\langle \text{assign} \rangle \rightarrow \langle \text{id} \rangle = \langle \text{expr} \rangle$
  - $\langle \text{id} \rangle \rightarrow A|B|C$
  - $\langle \text{expr} \rangle \rightarrow \langle \text{id} \rangle + \langle \text{expr} \rangle | \langle \text{id} \rangle * \langle \text{expr} \rangle | (\langle \text{expr} \rangle) | \langle \text{id} \rangle$Show a parse tree and a leftmost derivation for  $A = B*(C*(A+B))$
  
- 3.a) Explain how is the order of evaluation of attributes determined for the tree of a given grammar.
  - b) Explain about axiomatic semantics for proving correctness of programs
  
- 4.a) Describe the basic concepts of Denotational semantics.
  - b) How do you express the associativity of operators in grammar? Explain with an example.
  
- 5.a) What is Ambiguity? How can it be removed, show with an example.
  - b) Explain with an example how the weakest precondition for selection statements is derived.
  
- 6) What is an attribute grammar? Explain
  
- 7) Explain the approaches to implement lexical analysis
  
- 8) Explain recursive descent parser with an example
  
- 9) Write about Context Free grammars
  
- 10) Explain about LR parsing table with an example

**UNIT II**

1. Explain the following terms with respect to programming languages.
  - i) Dereferencing.
  - ii) Dangling pointer.

- 2a) Discuss the benefits of Operator overloading.
- b) Explain the different types of operators that can be overloaded in C++.
- 3a) Define Coersion , Type error, Type checking and strong typing
- b) Define name and structure Type compatibility
- 4a) Explain in detail Selection statements (or) control statements and its categories.
- b) What is short circuit evaluation? What are its advantages
- 5a) Distinguish between Static Strings and Dynamic Strings.
- b) Describe the process of Array initialization.
- 6a) Explain in detail Relational expressions, Boolean expressions and Short circuit Evaluation.
- b) What are guarded commands? Explain.
- 7a) Define Lifetime, Scope, Static Scope & Dynamic Scope. What are the general problems with Static Scoping?
- b) Discuss on implementation of pointer & reference types.
- 8a) Describe how pointers are used in C and C++ with examples?
- b) Discuss the various problems associated with pointers.
- 9a) What are mixed-mode expressions? Explain coercion in expressions.
- b) Explain with an example Ada "CASE" statement.
- c) What do you mean by unconditional branching and problems with unconditional branching.
- 10) Explain about mixed mode assignment with an example
- 11.a) How does operand evaluation order interact with functional side effect?
- b) What mixed-mode assignments are allowed in Ada?
- 12 a) What are the design issues for logically controlled loop statements?
- b) What is the main reason for user-located loop control statements invented?
- c) Discuss on implementation of pointer & reference types.
- 14) Explain enumeration and sub range datatype. Do they belong to primitive datatype or user defined data type ? Justify

15) Differentiate records from variant records with suitable examples

17 a) What is a dangling reference? How are they created, and why are they a problem?

c) Explain advantages and disadvantages of Java for loop compared to ADA for loop

18) a) Distinguish between Static Strings and Dynamic Strings.

b) Describe the categories of Array initialization.

### **unit 3**

1 Explain the various parameter passing mechanisms in C language and ADA with suitable examples.

2 Explain the various design issues of functions.

3) What is a sub program? What are the design issues of subprograms?

4) Describe about generic function in C++

5a) What are the advantages of static local variables over stack dynamic variables?

6. Write the differences between procedures and functions

7. Describe Deep access and shallow access for implementing dynamic scoping

8. Explain about overloaded methods

9. Explain about blocks

10. Explain about generic methods with examples

### **UNIT 4**

1 Explain how ADA supports concurrency

2. Define Monitor. Explain how cooperation synchronization and competition Synchronization are implemented using monitors.

3. Explain how cooperation synchronization and competition Synchronization

are implemented using message passing

4. Explain producer consumer problem using semaphores **or** Explain how cooperation synchronization and competition Synchronization are implemented using semaphores
- 5.. Explain the features of object oriented languages
- 6 Explain Exception handling with example.
7. Describe Java Event Model. List the handler methods.
8. Explain about JAVA Thread class and its methods
9. Explain about statement level concurrency
- .10 Explain producer consumer problem using semaphores **or** Explain how cooperation

### **Unit5**

- 1a) Define Functional Programming Language. List the properties of Functional Programming languages and describe each of them briefly.
2. list out the difference between the functional and imperative languages.
- 3.Explain how functions are defined in scheme and ML
- 4.What are the data objects provided by LISP? Explain with examples.
5. What is a functional form? Describe the functional compositions of LISP with examples.
- b) Write about function declaration in MLand what scoping rule is used ML,
- 9) Explain about scheme programming language
- 10)list out the difference between the functional and imperative languages.

### **UNIT 6**

- 1) Summarize Prolog's facilities for database manipulation. Explain the usage of assert,retract, and clause.
- 2)Explain about list structures and goal statements in PROLOG
- 3) What are the applications of Logic Programming?

- 4) Define Horn Clause with an example.
- 5) Briefly describe the process of resolution in Logic programming.
- 6) Explain Inferencing process of prolog
7. Discuss about basic elements of Prolog. Give examples.
8. Write differences between procedural and non –procedural languages
9. Explain about Generate and test programming
10. Explain about Rule and fact statements

#### Unit IV

1. Define Monitor. Explain how cooperation synchronization and competition Synchronization are implemented using monitors.
2. a) Write about checked and unchecked exceptions in java  
b) Explain about generic functions in C++
3. Write about
  - a) Message passing.
  - b) Data abstraction in Ada

## Unit V

1. a) List out the difference between the functional and imperative languages  
b) Explain the applications of functional programming
2. Explain about fundamentals of functional programming languages
2. a) What is a functional form? Explain with examples  
b) Write about Haskell

## Unit VI

1. What are the applications of Logic Programming?
2. Discuss about basic elements of Prolog. Give examples.
3. Briefly describe the process of resolution and unification in Logic programming with examples