ST. ANN’S COLLEGE OF ENGINEERING &TECHNOLOGY: CHIRALA
DEPARTMENT OF COMPUTERSCIENCE & ENGINEERING

SUBJECT: Principles of Programming Languages **ACADEMIC YEAR: 2016-17**

YEAR & SEM/SECTION: III-I

FREQUENTLY ASKED QUESTIONS

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

<assign>   <id> = <expr>

<id>   A|B|C

<expr> -   <expr> + <term> | < term >

<term> -   <term> * < factor > | < factor >

<factor>   (<expr>) | < id >

Show a parse tree and a leftmost derivation for B = C* (A * C + B) (D)

3.a) Explain how is the order of evaluation of attributes determined for the tree of a given grammar.
b) Compute the weakest precondition for the following sequences of assignment statements and their post conditions:

a:=3*2(2*6+a)
b:=2*a – 1
{b > 5}

4a) Describe the basic concepts of Denotational semantics.
b) How do you express the associativity of operators in grammar? Explain with an example.

2. 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.

5a) What is an attribute grammar? What are the features of attribute?
b)Give the operational semantics for the C statement

```
for (expr 1 ; expr 2; expr 3) {
    ….
                 }
```

6) Explain lexical analysis

7) Explain recursive descent parser with an example

8) Write about Context Free grammars

9) Explain about methods of describing syntax of programming languages

10) Explain about parsing

11) Explain about bottom up parsing with an example

12) Explain proof rules for following

a) assignment statements

b) selection

c) sequences

UNIT II

1a) Explain what is dynamic Array? How to implement dynamic arrays in pro-gramming languages.

b) 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 Lifetime, Scope, Static Scope & Dynamic Scope.

What are the general problems with Static Scoping?

b) Discuss on implementation of pointer & reference types.

4a) Explain in detail Selection statements and its categories.

b) What is short circuit evaluation? What are its avantages

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 & referencetypes.

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

d)what are the problems with unconditional branching.

10a) 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 ?

11.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?

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) What is a user-defined iteration control?

13a) Explain in detail Relational expressions, Boolean expressions and Short circuit Evaluation.

b) Define Lifetime, Scope, Static Scope & Dynamic Scope. What are the general problems with Static Scoping?

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

16a) Explain in detail Selection statements and its categories.

b) What is short circuit evaluation? What are its advantages?

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

b) What is pointer reversal? What problem does it address?

c) Do dangling references and garbage ever arise in the same programming language? Why or why not?

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

b) Describe the process of Array initialization.

unit 3

1)aCompare the parameter passing mechanisms of ALGOL and ADA languages.

b)Explain the various parameter passing mechanisms in C language with suitable examples.

2a) Explain, how multidimensional arrays can be passed as arguments in Ada language.

b) Explain the various design issues that are involved in functions.

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

b) Describe about generic function in C++

4a) What are the advantages of static local variables over stack dynamic variables?

b) Write the differences between procedures and functions.

5)What are the semantic models for parameter passing? Explain in detail.

6)Mention the different types of parameters. How are the actual parameters binded to formal to formal parameters?

UNIT 4

1a) Briefly explain the sub-program level concurrency.

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

2. a) Explain basic concepts and design issues of Exception handling.

b) Discuss how Exception handlers are helpful in C++ Exception handling.

3) Write about Semaphores, Monitors & Message passing.

4. a) How can an exception handler be written in java so that it handles any ex-ception.

b) How are exceptions bound to handlers in C++.

5)a) Explain how information hiding is provided in an Ada package.

b) What is the difference between private and limited private types in Ada?

c) Discuss about Binary Semaphores.

6 a) Explain Exception handling in Ada

7. a) Briefly explain Exception handling in Java with example.

8) Illustrate with a program the mechanisms of C++ exception handling

9a) How are instance of C++ template classes created? Explain with an example.

b) How are instances of Ada generic C classes created? Explain with an example.

10. a) Describe Java Event Model. List the handler methods.

11a) How are C++ and Java Class objects created? Give examples.

b) How are exceptions binded to handlers in Ada,C++ , Java?

Unit5

1a) Define Functional Programming Language. List the properties of Functional Programming languages and describe each of them briefly.

b) Why is the order of evaluation is essential in evaluating expressions? Explain in detail about Strictness and Lazy Evaluation

2a) What is a higher-order function? Give three examples of higher order functions. Also explain the concept of Currying in detail.

3a) Explain in detail how Control Flow and Assignment Expressions are defined in Scheme with examples. Also discuss briefly on the concept of Program as Lists in Scheme.

4a) Explain about the application of Functional programming Languages.

b) list out the difference between the functional and imperative languages.

5)Discuss about basic elements of Prolog. Give examples.

6. a) Explain the main features of Imperative Languages.

7a) Describe Predicate functions for symbolic atoms and list

b) What are the data objects provided by LISP? Explain with examples.

8a) 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)Expand FPL and LISP. Give fundamental and functional features of both

UNIT 6

1) Summarize Prolog's facilities for database manipulation. Explain the usage of assert,retract, and clause.

2) What are clauses, terms, and structures in Prolog? What are facts, rules, and queries? Give

examples of each.

3) What are the forms of Prolog term?

4) What are the applications of Logic Programming?

5) Define Horn Clause with an example. What sorts of logical statements cannot be captured in

6) Briefly describe the process of resolution in Logic programming.

7) What is a unification? Why is it important in logic programming?