PRINCIPLES OF PROGRAMMING LANGUAGES

Subject Code: CS702PC

Regulations : R16 - JNTUH

Class: IV Year B.Tech CSE I Semester

Department of Computer Science and Engineering

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PRINCIPLES OF PROGRAMMING LANGUAGES (CS702PC)

COURSE PLANNER

I.COURSE OVERVIEW:

Study of programming languages requires an examination of formal methods of describing the syntax and semantics of programming languages. Also ,implementation techniques for various language constructs such as lexical and syntax analysis, implementation of subprogram linkage and implementation of various programming languages are to be discussed. To briefly describe various programming paradigms. To provide conceptual understanding of High level language design and implementation. To introduce the power of scripting languages.

II.PRE-REQUISITES:

This course requires basic computer knowledge and programming languages like C.

III. COURSE OBJECTIVIES:

The following are the list of potential benefits of studying principles of programming language course.

1. To introduce the various programming paradigms.
2. To understand the evolution of programming languages.
3. To understand the concepts of OO languages, functional languages, logical and scripting languages.
4. To introduce the principles and techniques involved in design and implementation of modern programming languages.
5. To introduce the notations to describe the syntax and semantics of programming languages.
6. To introduce the concepts of concurrency control and exception handling.
7. To introduce the concepts of ADT and OOP for software development.

IV. COURSE OUTCOMES:

	Course Outcomes (CO)	**Knowledge Level (Blooms Level)**
CO1	***Understand*** to express syntax and semantics in formal notation.	L2: Understand
CO2	***Employ*** to apply suitable programming paradigm for the application.	L3: Apply
CO3	***Design*** to program in different language paradigms and evaluate their relative benefits	L6: Create
C04	**Understand** the programming paradigms of modern programming languages.	L2: Understand
C05	**Understand** the concepts of ADT and OOP.	L2: Understand
C06	***Knowledge*** to compare the features of various programming languages.	L1: Remember

V. HOW PROGRAMS OUTCOMES ARE ASSESSED:

Program Outcomes (POs)		**Level**	**Proficiency assessed by**
PO1	**Engineering knowledge**: Apply the knowledge of	**3**	Assignments

Program Outcomes (POs)		Level	Proficiency assessed by
	mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.		
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	**3**	Assignments
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	**2**	Open ended experiments /
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	**2**	Open ended experiments /
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	**1**	Mini Project
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	**-**	--
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	**-**	--
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	**-**	--
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams,	**-**	--

Program Outcomes (POs)		Level	Proficiency assessed by
	and in multidisciplinary settings.		
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	**1**	Seminars / Term Paper
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	**-**	--
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	**2**	Competitive Examinations

VI. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes (PSOs)		Level	Proficiency assessed by
PSO1	**Software Development and Research Ability:** Ability to understand the structure and development methodologies of software systems. Possess professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open source platforms. Use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations.	**3**	Lectures, Assignments
PSO2	**Foundation of mathematical concepts:** Ability to apply the acquired knowledge of basic skills, principles of computing, mathematical foundations, algorithmic principles, modeling and design of computer- based systems in solving real world engineering Problems.	**2**	Mini Projects / Experiments
PSO3	**Successful Career:** Ability to update knowledge continuously in the tools like Rational Rose, MATLAB, Argo UML, R Language and technologies like Storage, Computing, Communication to meet the industry requirements in creating innovative career paths for	**2**	Experiments / Tools

Program Specific Outcomes (PSOs)		Level	Proficiency assessed by
	immediate employment and for higher studies.		

VII.SYLLABUS:

UNIT- I :

Preliminary Concepts: Reasons for studying concepts of programming languages, programming domains, language evaluation criteria, influences on language design, language categories, language design trade-offs, implementation methods, programming environments, Evolution of Major Programming Languages.

Syntax and Semantics: General problem of describing syntax, formal methods of describing syntax, attribute grammars, describing the meanings of programs

UNIT- II:

Names, Bindings, and Scopes: Introduction, names, variables, concept of binding, scope, scope and lifetime, referencing environments, named constants

Data types: Introduction, primitive, character, string types, user defined ordinal types, array, associative arrays, record, tuple types, list types, union types, pointer and reference types, type checking, strong typing, type equivalence

Expressions and Statements: Arithmetic expressions, overloaded operators, type conversions, relational and boolean expressions, short- circuit evaluation, assignment statements, mixed-mode assignment

Control Structures – introduction, selection statements, iterative statements, unconditional branching, guarded commands.

UNIT- III:

Subprograms: Fundamentals of subprograms, design issues for subprograms, local referencing environments, parameter passing methods, parameters that are subprograms, calling subprograms indirectly, overloaded subprograms, generic subprograms, design issues for functions, user defined overloaded operators, closures, co routines

Implementing subprograms: General semantics of calls and returns, implementing simple subprograms, implementing subprograms with stack-dynamic local variables, nested subprograms, blocks, implementing dynamic scoping

Abstract Data types: The concept of abstraction, introductions to data abstraction, design issues, language examples, parameterized ADT, encapsulation constructs, naming encapsulations

UNIT- IV:

Object Oriented Programming: Design issues for OOP, OOP in Smalltalk, C++, Java, Ada 95, Ruby, Implementation of Object-Oriented constructs.

Concurrency: introduction, introduction to subprogram level concurrency, semaphores, monitors, message passing, Ada support for concurrency, Java threads, concurrency in functional languages, statement level concurrency. Exception Handling and Event Handling: Introduction, exception handling in Ada, C++, Java, introduction to event handling, event handling with Java and C#.

UNIT-V :

Functional Programming Languages: Introduction, mathematical functions, fundamentals of functional programming language, LISP, support for functional programming in primarily imperative languages, comparison of functional and imperative languages

Logic Programming Language: Introduction, an overview of logic programming, basic elements of prolog, deficiencies of prolog, applications of logic programming.

Scripting Language: Pragmatics, Key Concepts, Case Study : Python – Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library. (Text Book 2)

TEXT BOOKS:

1. Concepts of Programming Languages, Robert .W. Sebesta 10th edition, Pearson Education.
2. Programming Language Design Concepts, D. A. Watt, Wiley India Edition.

REFERENCE BOOKS:

1. Programming Languages, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C. Louden and K A Lambert., 3rd edition, Cengage Learning.
3. Programming Language Concepts, C Ghezzi and M Jazayeri, Wiley India.
4. Programming Languages 2nd Edition Ravi Sethi Pearson.
5. Introduction to Programming Languages Arvind Kumar Bansal CRC Press.

VII.LESSON PLAN:

S.NO	Week	Topic	Course Learning Outcomes	Teaching Methodologies	References
1	1	Preliminary Concepts: Reasons for studying concepts of programming languages,	Learning Programming Concepts	Chalk and Talk	T1, R2
2		programming domains	Learning Different Program Domains	Chalk and Talk	T1, R2
3		language evaluation criteria,	Understand language designs	Chalk and Talk	T1, R2
4		influences on language design,	Analyze trade-offs	Chalk	T1, R2
5		language categories,	Analyze program implementation	Chalk and Talk	T1, R2
6	2	language design trade-offs	Learning Programming languages	Chalk and Talk	T1, R2
7		implementation methods,	Remember language syntaxes	Chalk and Talk	T1, R2
8		programming environments,	Learning Syntax methods	Chalk and Talk	T1, R2
9		Evolution of Major Programming	Learning Grammars	Chalk and Talk	T1, R2

		Languages.			
10		Syntax and Semantics: General problem of describing syntax,	Understand meanings of different program languages	Chalk and talk	T1, R2
11	3	formal methods of describing syntax,	Learning Basic rules of program language	Chalk and Talk	T1, R2
12		attribute grammars,	Learning Basic rules of program language	Chalk and Talk	T1, R2
13		describing the meanings of programs	Learning Basic rules of program language	Chalk and Talk	T1, R2
14		Names, Bindings, and Scopes: Introduction,	Learning Basic rules of program language	Chalk and Talk	T1, R2
15		names, variables,	Learning & understanding the Basic rules of program language	Chalk and Talk	T1, R2
16	4	concept of binding, scope, scope and lifetime,	Understand the type conversion	Chalk and Talk	T1, R2
17		referencing environments, named constants	Understand all the Operations	Chalk and Talk	T1, R2
18		Data types: Introduction, primitive, character,	Understand Boolean Expressions	Chalk and Talk	T1, R2
19		string types, user defined ordinal types, array, associative arrays,	Understand control structures	Chalk and Talk	T1, R2
20		record, tuple types, list types, union types,	Analyze branching methods	Chalk and Talk	T1, R2
21	5	pointer and reference types,	Create sub programs	Chalk	T1, R2
22		type checking, strong typing,	Analyze Reference methods	Chalk	T1, R2
23		type equivalence	Evaluate sub programs	Chalk and Talk	T1, R2
24		Expressions and Statements: Arithmetic expressions,	Evaluate sub program	Chalk and Talk	T1, R2
25		overloaded operators, type conversions,	Understand Overloading	Chalk and Talk & PPT	T1, R2
26	6	relational and boolean expressions, short-circuit evaluation,	Apply different implementations	Chalk and Talk	T1, R2
27		assignment statements,	Evaluate sub program	Chalk and Talk	T1, R2

		mixed-mode assignment	with rules		
28		Control Structures – introduction, selection statements,	Evaluate sub program with rules	Chalk and Talk	T1, R2
29		iterative statements,	Understand Data abstraction	Chalk and Talk	T1, R2
30		unconditional branching,	Understand different program language designs	Chalk and Talk	T1, R2
31	7	guarded commands.	Understand different program language designs	Chalk and Talk & PPT	T1, R2
32		Subprograms: Fundamentals of subprograms,	Understand oop implementation	Chalk and Talk	T1, R2
33		design issues for subprograms,	Evaluate subprograms	Chalk and Talk	T1, R2
34		local referencing environments,	Evaluate subprograms according to rules	Chalk and Talk	T1, R2
35		parameter passing methods,	Implement java programming	Chalk and Talk	T1, R2
36	8	parameters that are subprograms,	Create programming with events	Chalk and Talk	T1, R2
37		calling subprograms indirectly,	Understand the handling Exceptions	Chalk and Talk & PPT	T1, R2
38		overloaded subprograms, generic subprograms,	Understand the handling Exceptions	Chalk and Talk	T1, R2
39		design issues for functions,	Apply different functional rules	Chalk and Talk	T1, R2
40		user defined overloaded operators, closures, co routines	Apply different functional rules	Chalk and Talk	T1, R2
41	9	Implementing subprograms: General semantics of calls and returns,	Understand functional programming	Chalk and Talk	T1, R2
42		implementing simple subprograms,	Understand functional programming	Chalk and Talk	T1, R2
43		implementing subprograms with stack-dynamic local variables,	Understand functional programming	Chalk and Talk & PPT	T1, R2
44		nested subprograms, blocks,	Apply prolog in Applications	Chalk and Talk	T1, R2
45		implementing dynamic	Learning Scripting	Chalk and Talk	T1, R2

		scoping	Language		
46	10	Abstract Data types: The concept of abstraction,	Understand Scripting Language with basics	Chalk and Talk	T1, R2
47		introductions to data abstraction,	Understand control structures	Chalk and Talk	T1, R2
48		design issues, language examples,	Understand Data Abstraction	Chalk and Talk	T1, R2
49		parameterized ADT,	Apply Data Compilation	Chalk and Talk & PPT	T1, R2
50		encapsulation constructs, naming encapsulations	Learning Scripting Language	Chalk and Talk	T2, R2
51	11	Object Oriented Programming: Design issues for OOP,	Understand Scripting Language with basics	Chalk and Talk	T2, R2
52		OOP in Smalltalk, C++, Java, Ada 95, Ruby,	Understand control structures	Chalk and Talk	T2, R2
53		Implementation of Object-Oriented constructs.	Understand procedural Abstraction	Chalk and Talk	T2, R2
54		Concurrency: introduction, introduction to subprogram level concurrency,	Understand Data Abstraction	Chalk and Talk	T2, R2
55		semaphores, monitors,	Apply program Compilation	Chalk and Talk & PPT	T2, R2
56	12	message passing,	Evaluate & Create Scripting Program	Chalk and Talk	T2, R2
57		Ada support for concurrency,	Evaluate & Create program with Ruby language	Chalk and Talk	T2, R2
58		Java threads, concurrency in functional languages,	Understand Scripting Language with basics	Chalk and Talk	T1, R2
59		statement level concurrency	Understand control structures	Chalk and Talk	T1, R2
60		. Exception Handling and Event Handling: Introduction,	Understand Data Abstraction	Chalk and Talk	T1, R2
61	13	exception handling in Ada, C++, Java,	Apply Data Compilation	Chalk and Talk & PPT	T1, R2
62		introduction to event handling,	Learning Scripting Language	Chalk and Talk	T2, R2
63		event handling with Java	Understand control	Chalk and Talk	T2, R2

		and C#.	structures		
64		Functional Programming Languages: Introduction, mathematical functions,	Understand procedural Abstraction	Chalk and Talk	T2, R2
65		fundamentals of functional programming language,	Understand Data Abstraction	Chalk and Talk	T2, R2
66	14	LISP, support for functional programming in primarily imperative languages,	Apply program Compilation	Chalk and Talk	T2, R2
67		comparison of functional and imperative languages Logic	Evaluate & Create Scripting Program	Chalk and Talk & PPT	T2, R2
68		Programming Language: Introduction, an overview of logic programming,	Evaluate & Create program with Ruby language	Chalk and Talk	T2, R2
69		basic elements of prolog, deficiencies of prolog, applications of logic programming.	Understand Scripting Language with basics	Chalk and Talk	T1, R2
70		Scripting Language: Pragmatics, Key Concepts,	Understand control structures	Chalk and Talk	T1, R2
71	15	Case Study : Python – Values and Types, Variables ,	Understand control structures	Chalk and Talk	T2, R2
72		Storage and Control, Bindings and Scope,	Understand procedural Abstraction	Chalk and Talk	T2, R2
73		Procedural Abstraction, Data Abstraction,	Understand Data Abstraction	Chalk and Talk & PPT	T2, R2
74		Separate Compilation, Module Library.	Apply program Compilation	Chalk and Talk	T2, R2
75		Separate Compilation, Module Library.	Evaluate & Create Scripting Program	Chalk and Talk	T2, R2
76	16	Revision	Evaluate & Create program with Ruby language	Chalk and Talk	T2, R2
77		Revision	Understand Scripting Language with basics	Chalk and Talk	T1, R2
78		Revision	Understand control	Chalk and Talk	T1, R2

			structures		
79		Revision	Evaluate & Create program with Ruby language	Chalk and Talk & PPT	T2, R2
80	17	Revision	Understand Scripting Language with basics	Chalk and Talk	T1, R2
81		Revision	Understand control structures	Chalk and Talk	T1, R2
82		Revision	Evaluate & Create program with Ruby language	Chalk and Talk	T1, R2
				Chalk and Talk	

IX. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

Course Outcomes	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	-	-	-	-	-	-	1	-	1	2	2	2
CO2	3	3	2	2	1	-	-	-	-	1	-	2	3	2	2
CO3	3	3	3	1	1	-	-	-	-	1	-	2	3	1	1
CO4	3	3	2	2	1	-	-	-	-	1	-	2	3	2	2
CO5	3	3	2	2	1	-	-	-	-	1	-	2	3	2	2
CO6	2	2	-	-	-	-	-	-	-	1	-	1	2	1	1
AVG	2.67	2.67	2.00	1.75	1.0	-	-	-	-	1.0	-	1.67	2.67	1.67	1.67

X.QUESTION BANK:

UNIT- 1

Short Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcome
1. Define imperative programming language?	Understand	CO1

2. Differentiate between special purpose and general purpose languages?	**Understand**	**C01**
3. Differentiate between Syntax and Semantics?	**Knowledge**	**CO1**
4. Write BNF and EBNF grammar for expressions?	**Knowledge**	**CO1**

Long Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcomes
1. Explain list of criteria for language evaluation**?**	**Create**	**CO1**
2. Explain the reasons for studying concepts of programming language?	**Analyze**	**CO1**
3. Explain the concept of orthogonality in program language Design?	**Understanding**	**CO1**
4. Explain in detail about attribute grammar for simple assignment statement	**Create**	**CO1**
5. Describe three advantages of LR parser?	**Analyze**	**CO1**

UNIT- 2

Short Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcomes
1. Define data type and importance of data types?	**Understand**	**CO2**
2. Explain use of C++ reference type?	**Understand**	**CO2**
3. What are the advantages and disadvantages of implicit declaration?	**Knowledge**	**CO2**
4. What are the advantages and disadvantages of implicit declaration?	**Knowledge**	**CO2**
5. Explain associative arrays, their structure and operations?	**Analyze**	**CO2**

Long Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcomes
1. Discuss about various data types?	**Create**	**CO2**
2. Define an array. Explain the design issues and different types of arrays?	**Analyze**	**CO2**
3. Explain unconditional statements supported by different programming languages?	**Understanding**	**CO2**
4. Describe the various control statements in programming languages.	**Create**	**CO2**

5. Discuss guarded commands in detail?	**Analyze**	**CO2**

UNIT -3

Short Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcomes
1. Define how C language deals with scope and lifetime of a variable?	**Understand**	**CO3**
2. Define subprogram and explain its general characteristics?	**Understand**	**CO3**
3. Explain about parameter passing methods?	**Knowledge**	**CO3**
4. Write about co routines?	**Knowledge**	**CO3**
5. Write about overloaded Programs	**Knowledge**	**CO4**
1. Explain associative arrays, their structure and operations?	**Analyze**	**CO4**

Long Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcomes
1. Define subprogram and explain the distinct categories of sub programs.	**Create**	**CO3**
2. What is Generic Subprogram give few examples in Ada,C++,Java?	**Analyze**	**CO3**
3. Write short note on overloaded sub programs.	**Understanding**	**CO3**
4. Discuss how generic functions are implemented in C ++.	**Create**	**CO4**
5. Explain how a sub program name can be passed as parameter to other sub programs.	**Analyze**	**CO4**

UNIT -4

Short Answer Questions

QUESTIONS	Blooms taxonomy level	Course Outcome
1. What problems can occur using C to define abstract data types	**Understand**	**CO4**
2. Distinguish between C++ class and ADA package	**Understand**	**CO4**
3. Distinguish C++ throw specification and throw clause in Java	**Knowledge**	**CO4**
4. Explain the uses of exception handling in programming languages?	**Knowledge**	**CO5**
5. Write the applications of logic programming?	**Analyze**	**CO5**

Long Answer Questions

QUESTIONS	Blooms taxonomy level	Course outcome
1. Explain the object oriented programming in small talk, C++ and Java?	**Create**	**CO4**

2. Define semaphores. Explain how cooperation and competition synchronization are implemented using semaphores?	**Analyze**	**CO4**
3. Explain the applications of Logic programming?	**Understanding**	**CO4**
4. Define a task . Explain the different states of Task?	**Create**	**CO5**
5. Explain dynamic binding in C++ and Java?	**Analyze**	**CO5**

UNIT -5

Short Answer Questions

QUESTIONS	**Blooms taxonomy level**	**Course Outcome**
1. What is S expression and how it is evaluated with an example.	**Understand**	**CO5**
2. Write a LISP function that calculates sum of numbers using a vector	**Understand**	**CO5**
3. List few characteristics of Python language?	**Knowledge**	**CO5**
4. List few examples of scripting languages?	**Knowledge**	**CO6**
5. List the draw backs of using an imperative language compared to FP?	**Knowledge**	**CO6**

Long Answer Questions

QUESTIONS	**Blooms taxonomy level**	**Course Outcome**
1. Describe the following for LISP a)Data types and structures b)LISP interpreter Compare Functional Languages with Imperative languages	**Create**	**CO5**
2. What are the three features of Haskell that make it significantly different from Scheme	**Analyze**	**CO5**
3. Explain procedural and data abstraction in python	**Understanding**	**CO5**
4. Discuss briefly about HTML parsing and CGI argument parsing.	**Create**	**CO6**
5. What is scripting and explain the characteristics of scripting languages	**Analyze**	**CO6**

OBJECTIVE QUESTIONS

UNIT-1

1. The following is the widely used programming language developed for Artificial Intelligence Application
   A)LISP b)FORTRAN c)COBOL d).ALGOL 602.
2. The following language require Interpreter
   a) C++ b). C c). COBOL d). APL
3. In C and C++ the asterisk (*) denotes the following operation.
   a)Dereferencing b) negation c) referencing d) address
4. In FORTRAN90, Loop parameters are evaluated

a)Thrice b) only once c) twice d) every time

5.The following Type compatibility is described in Semantics

a)Structured b) Static c) Denotional d) Dynamic

UNIT-2

1.The following language has pointer concept

a) Java b) c++ c)DHTML d) HTML

2. The first high level programming to included pointer variables was

a). Fortran b) PL/1 c) ALGOL 60 d) ADA

3. The following variables should not appear in recursive functions

a)Register b) static c) auto d) Extern

4. PDA means

a). Pop down Automata b). Push down automata

c). Push Dip Automata d). Push Down Automatic

5. The type of the following operator ?: is

a). unary b). not an operator c). ternary d). binary

UNIT-3

1. A describes the interface to and the actions of the subprogram []

1. subprogram 2. Interface 3.scope 4.blocks

2. The caller is _____during execution of the called subprogram []

A) suspended (B) terminated (C) blocked (D) none

3. The period of time between an allocation and its subsequent disposal is called

(A)Life time (B) scope (C) binding (D) all

4. In java, object parameters are passed using[ ]

(A) call-by-name (B) call-by-value (C) call-by-reference (D) call-by-result

5. Variables defined inside the subprogram is called [ ]

A) Global variables B) Local Variables C) Parameter D)None

UNIT-4

1. _____ are used along with the variables in Prolog

A) quantifiers B)qualifiers C)terms D) B&D

2. Finding value to variable in prolog is

A) Unification B) Simplification C) Matching D)exceptional propagation

3. Java clause provides a mechanism for guaranteeing that some code will be executed how the execution of a try compound terminates.

A) Finally B) throws C) try D) catch

4. The categories of exceptions in Java are

a) checked b) unchecked c)constant d)a&b

5. Re-consideration of path is

a) Backtracking b) BFS c) forward chaining d) backward chaining

6. Logic programming languages are used in

a) RDBMS b)expert systems

c)natural language processing d)all

UNIT-5

1. A static-scoped functional language with syntax that is closer to Pascal than to LISP

A)ML B) HASKELL C) C D) FORTRAN

2. _____Uses lazy evaluation (evaluate no sub expression until the value is needed)

A)ML B)HASKELL C) LISP D) PROLOG

3. Pure LISP has only two kinds of data structures atoms and [ ]
A). Arrays B). Lists C). variables D). Stack
4. The design of the functional languages is based on
1.mathematical functions 2. Predicate calculus 3. Relations 4.none
5. The first functional programming language
A). ML B). HASKELL C). LISP D). FORTRAN

Fill in the blanks

UNIT-1

1. C was developed by _____
2. BNF is _____
3. _____is the language of axiomatic semantics.
4. _____semantics was defined in conjunction with the development of a method to prove the correctness of programs.
5. _____can be used to accept the sentence of a language.

UNIT-2

1._____ refers to a data type in which all the values compromises of a sequence of character

2._____keyword is used to define global variables visible in all the object modules

3._____is a compound expression that contains three expressions.

4.In C switch –case statement the default expression type c a n be _____.

5._____language support independent compilation

UNIT-3

1._____ is the first part of the definition, including the name, the kind of subprogram, and the formal parameters

2.The _____is a subprogram's parameter profile and, if it is a function, its return type

3.C++ A special pointer type called reference type for _____

4.Java :All parameters are _____

5.C _____is achieved by using pointers as parameters

UNIT-4

1. Nearly all programming languages support process abstraction with _____
2. _____does not currently support parameterized classes
3. A class that inherits is a ____or _____
4. The entire collection of methods of an object is called its _____.
5. Task execution control is maintained by a program called the_____

UNIT- 5

1._____is strongly typed (whereas Scheme is essentially type less) and has no type coercions

2._____ is used for throw-away programs

3._____ is a process of writing small sized programs so as to glue different software tools

4._____ is a open source language

5._____is the only parameter passing method by Python.

GATE: Not Applicable
IES: Not Applicable
XI.WEBSITES:
1.www.nptel.iitm.ac.in/video.php?subjectId=106102067
2. www.cs.cmu.edu/~rwh/courses/ppl/
3. http://www.apl.jhu.edu/~hall/lisp.html
4. http://www.swi-prolog.org/pldoc/refman/

XII.EXPERT DETAILS:
1. Dr. K. Gopinath
   Professor
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2. Dr. A. GOVARDHAN
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XIII. JOURNALS:
(National & International)
1. SCP - Science of Computer Programming
2. TOPLAS - ACM Transactions on Programming Languages and Systems
3. JFP - Journal of Functional Programming
4. JLP - The Journal of Logic and Algebraic Programming
5. TPLP - Theory and Practice of Logic Programming
6. CL - Computer Languages, Systems & Structures
7. IJPP - International Journal of Parallel Programming
8. JOOP - Journal of Object-oriented Programming

XIV.LIST OF TOPICS FOR STUDENT SEMINARS:
1. Reasons for studying programming language
2. General problem of describing syntax and Axiomatic semantics for common programming language features
3. Pointer Reference types and applications in various programming languages.
4. Short circuit evaluation and Mixed mode assignment

XV.CASE STUDIES/SMALL PROJECTS:
Write a BNF grammar for e-mail addresses that can express the following examples:
morgan@cs.williams.edu
steele@java.com
Morgan.McGuire@williams.edu -
dingle@_.com 377..5@hotmail.com
president@whitehouse.gov
underscorer@slashdot.org
scott_mccann@2mail.f4st.111.org and
rejects the following:

bad#email.com hello@world
funny/symbol@none.gov jon@edu
illegal@domain.name whole@lota@at.com
empty@..com

Assume that the only legal top-level domains (TLDs) in this grammar are gov, edu, com, and org, and that there must be at least two period-separated names to the right of the @, and that those names must contain at least one character each. Assume that the only legal symbols in an e-mail address to the left and right of the @ are period,
underscore, and dash (minus). (This is all a simplification of real e-mail grammars to make the problem easier. If you happen to know the real rules...forget them while you're working on this problem! You can find the real grammar in RFCs
1034 and 822)Remember to put quotes around terminals and angle-brackets around non-terminals. You may use the regular expression operators [ ] + * for convenience in addition to pure BNF grouping parentheses and the exclusive
or operator, |
. The following productions are provided:

<digit> ::= `0' | `1' | `2' | `3' | `4' | `5' | `6' | `7' | `8' | `9'
<alpha> ::= 'a' | `b' | `c' | `d' | `e' | `f' | `g' | `h' | `i' | `j' | `k' | `l' | `m' | `n' |
`o' | `p' | `q' | `r' | `s' | `t' | `u' | `v' | `w' | `x' | `y' | `z' |
'A' | `B' | `C' | `D' | `E' | `F' | `G' | `H' | `I' | `J' | `K' | `L' | `M' | `N' |
`O' | `P' | `Q' | `R' | `S' | `T' | `U' | `V' | `W' | `X' | `Y' | `Z'