



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

Dundigal, Hyderabad -500 043

INFORMATION TECHNOLOGY

TUTORIAL QUESTION BANK

Course Name	:	PRINCIPLES OF PROGRAMMING LANGUAGES
Course Code	:	A40511
Class	:	II B. Tech II Semester
Branch	:	Information Technology
Year	:	2016 – 2017
Course Faculty	:	Mrs. B.Dhanalaxmi, Associate Professor, IT

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

PART – A (SHORT ANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – I			
1	Define Programming Language.	Knowledge	1
2	Difference between sentence and sentential form.	Analyze	2
3	Define Syntax and Semantics.	Knowledge	2
4	Differentiate between Syntax and Semantics.	Analyze	1
5	Write BNF notation for i) For loop ii) if-else condition	Understand	2
6	Give grammars for simple assignment statements.	Understand	2
7	Give unambiguous grammar for if-then-else.	Understand	2
8	Define Parse trees.	Knowledge	2
9	Define Denotational semantics.	Knowledge	1
10	Define Operational semantics.	Knowledge	1
11	Define Axiomatic semantics.	Knowledge	2
12	Differentiate compiler and interpreter.	Analyze	2

13	Describe language recognizers.	Understand	1
14	Describe generators.	Understand	1
15	Distinguish simplicity and orthogonality.	Analyze	2
UNIT – II			
1	Distinguish static and dynamic scoping.	Analyze	2
2	Define associative arrays.	Knowledge	2
3	Define guarded commands?	Knowledge	2
4	Distinguish named type and structure type compatibility.	Analyze	3
5	List the merits of sub range types.	Knowledge	3
6	Differentiate union and enumeration.	Analyze	3
7	Define data type.	Knowledge	2
8	List the merits of type checking.	Knowledge	2
9	Define user defined data type.	Knowledge	2
10	Define widening and narrowing conversions?	Knowledge	3
UNIT – III			
1	Define scope and lifetime of a variable.	Knowledge	3
2	Differentiate shallow and deep binding.	Analyze	3
3	Define subprogram.	Knowledge	3
4	Define procedures.	Knowledge	3
5	Define local referencing environment.	Knowledge	4
6	Differentiate static and dynamic binding.	Analyze	4
7	Define the phrase 'Adhoc-binding'	Knowledge	4
8	Differentiate co-routines and subprograms	Analyze	4
9	Define the phrase 'overloaded subprogram'	Analyze	3
10	Discuss Generic sub programs.	Understand	4
UNIT – IV			
1	Define an exception.	Knowledge	4
2	Define a thread.	Knowledge	4
3	Define concurrency.	Knowledge	5
4	Define binary semaphore.	Knowledge	5
5	Define monitors.	Knowledge	5
6	Define mutual exclusion.	Knowledge	5
7	Define deadlock.	Knowledge	5
8	Define an abstract data type.	Knowledge	5
9	Define logic programming language.	Knowledge	5
10	Define data abstraction.	Knowledge	6
UNIT – V			
1	Give the meaning of lazy evaluation mean.	Understand	6
2	Define procedural abstraction.	Knowledge	6
3	List few characteristics of Python language.	Knowledge	7
4	Define functional language.	Knowledge	7
5	Define imperative language.	Knowledge	7

S. No	Question	Blooms Taxonomy Level	Course Outcome
6	Give the meaning of scripting language.	Understand	6
7	List few examples of scripting languages.	Knowledge	7
8	List keywords of Python language.	Knowledge	7
9	List data types of Python language.	Knowledge	7
10	Define the term separate compilation in Python.	Knowledge	7

PART – B (LONGANSWER QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT - I			
1	Discuss language evaluation criteria and the characteristics that affect them.	Understand	1
2	List the potential benefits of studying programming language concept.	Knowledge	2
3	Explain syntax of a “for” statement in PASCAL using BNF notation and syntax graphs.	Understand	2
4	Explain syntax of declaration statement in PASCAL using BNF notation and syntax graphs.	Understand	1
5	Compute the weakest precondition for each of the following simple assignment statements and post conditions. $a=2*(b-1)-1 \{a>0\}$ $b=(c+10)/3 \{b>6\}$ $a=a+2*b-1 \{a>1\}$ $X=2*y+x-1 \{x>11\}$	Apply	2
6	Write BNF notation for following: a) For loop b) If-else condition c) Structure definition	Apply	2
7	Define left most derivation. Prove that the following grammar is ambiguous. <pre> <program>->begin<stmt_list>end <stmt_list>-><stmt> <stmt>;<stmt_list> <stmt>-><var>=<expression> <var>-> A B C <expression>-><var>+<var> <var>-<var> <var> </pre>	Knowledge	2
8	State the given grammar is ambiguous. <pre> <assign> -><id>=<expr> <id>->A B C <expr>-><expr>+<expr> <expr>*<expr> (<expr>) <id> </pre>	Knowledge	2
9	List the three general methods of implementing a programming language.	Knowledge	1

10	Explain different aspects of the costs of a programming language.	Understand	2
UNIT - II			
1	Define heterogeneous array. Discuss the design issues of arrays.	Knowledge	2
2	Explain in detail the design issues of arithmetic expressions.	Understand	2
3	Discuss structural and name equivalence for types. Give an example of a language used for each approach.	Understand	2
4	Define a variable and what the attributes of a variable are. Elaborate on address of a variable.	Knowledge	3
5	Write a note on Boolean and relational expressions.	Apply	3
6	Explain the different types of relational operators used in C, Ada and Fortran 95.	Understand	3
7	List the advantages and disadvantages of mixed mode arithmetic expressions?	Knowledge	2
8	Define array and record. Classify arrays based on storage allocation. What are the advantages and disadvantages of allocation memory during compilation time and run time.	Knowledge	2
9	Define static, fixed stack dynamic, stack dynamic, fixed heap dynamic and dynamic arrays. What are the advantages of each?	Knowledge	2
10	List the design issues of pointers. Explain.	Knowledge	3
UNIT - III			
1	Discuss generic subprograms in C++ and java.	Understand	3
2	Explain about the concept of local referencing environment?	Understand	3
3	Define subprograms. What are the advantages of subprograms?	Knowledge	3
4	Discuss in detail about lifetime of a variable.	Understand	3
5	Discuss the design issues of subprogram and its operations performed on them.	Understand	4
6	Explain different methods of parameter passing mechanisms to subprograms.	Understand	4
7	Explain about Co routines.		4
8	Explain the design considerations of parameter passing.	Understand	4
9	Discuss about procedures and functions in subprograms.	Understand	3
10	Define shallow and deep binding for referencing environment of subprograms that have been passed as parameters.	Knowledge	4
UNIT – IV			
1	Describe how exception is handled in ADA with an example.	Understand	4
2	Describe briefly about Semaphores.	Understand	4
3	Describe briefly about Monitors.	Understand	5
4	Discuss Object Oriented Programming in SMALLTALK.	Understand	5
5	Write about goal statements and simple arithmetic in PROLOG.	Apply	5
6	Define binary semaphore. What is counting semaphore? What are the primary problems with using semaphores to provide synchronization?	Knowledge	5
7	Explain the following terms: i. process synchronization ii. race condition iii. binary semaphores	Understand	5

	iv. MIMD		
8	Explain different types of propositions present in logic programming.	Understand	5
9	Describe the cooperation synchronization and competition synchronization in message passing.	Understand	5
10	Discuss how dining philosopher's problem and producer consumer problem are solved using concurrency in Ada.	Understand	5
UNIT – V			
1	Write about control constraints in Python.	Apply	6
2	Write about data abstraction in Python.	Apply	6
3	Write about data types and structures of LISP and LISP interpreter.	Apply	7
4	List the ways in which ML is significantly different from scheme.	Knowledge	7
5	Describe the scoping rule in common LISP, ML and HASKELL.	Understand	7
6	Explain the characteristics of scripting languages.	Understand	6
7	Discuss in detail about the python primitive types.	Understand	6
8	Explain about LISP functional programming language.	Understand	7
9	Explain the features of scripting languages.	Understand	7
10	Explain the concept of Pragmatics.	Understand	7

PART – C (PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT – I			
1	Give some reasons why computer scientist and professional software developers should study general concepts of language design and evaluation.	Understand	1
2	Write reasons for the statement: “Exception handling is very important, but often neglected by programming languages”.	Apply	2
3	Write reasons for the statement: “A programming language can be compiled or interpreted”. Give relative advantages and disadvantages of compilation and interpretation. Give examples of compiled and interpreted languages.	Apply	2
4	What does it mean for a program to be reliable?	Apply	1
5	What are the three fundamental features of an object oriented programming language?	Apply	2
6	Describe some design trade-offs between efficiency and safety in some language you know.	Understand	2
7	Why is the Von Neumann bottleneck important?	Understand	2
8	Which produces faster program execution, a compiler or a pure interpreter?	Knowledge	2
9	Why is type checking the parameters of a subprogram important?	Knowledge	1
10	Explain the different aspects of the cost of a programming language?	Understand	1

S. No	Question	Blooms Taxonomy Level	Course Outcome
UNIT - II			
1	List what advantages does java's break statement have over C's and C++'s break statement.	Knowledge	2
2	State whether static binding is more reliable or dynamic binding. Explain why.	Knowledge	2
3	List the design issues for Names with suitable examples.	Knowledge	2
4	After language design and implementation [what are the four times bindings can take place in a program?]	Analyze	3
5	Describe a situation where a history-sensitive variable in a subprogram is useful?	Understand	3
6	What are the arguments for and against representing Boolean values as single bits in memory?	Understand	3
7	List the advantages of using control structures in any of the compiled programming languages.	Knowledge	2
8	Discuss the merits of guarded commands.	Understand	2
9	Discuss the merits and demerits of short circuit evaluation.	Understand	2
10	Discuss the importance of Named constants with suitable examples.	Understand	3
UNIT - III			
1	Compare the parameter passing mechanisms of ALGOL and ADA.	Analyze	3
2	State the importance of Local Referencing Environments with suitable examples.	Knowledge	3
3	Discuss about different parameter passing methods of Ada language.	Understand	3
4	In what way is static checking better than dynamic type checking.	Analyze	3
5	What are the three general characteristics of subprogram.	Understand	4
6	Which two languages allow multiple values to be returned from a function?	Analyze	4
7	In what way co-routines are different from conventional subprograms?	Analyze	4
8	What causes a C++ function to be instantiated?	Knowledge	4
9	What are the three semantic models of parameter passing?	Knowledge	3
10	Describe the way that aliases can occur with pass-by-reference?	Understand	4
UNIT - IV			
1	Discuss the reasons for using exception handlers in a programming language. What if there exist programming languages with no exception handlers.	Understand	4
2	Give the sample code to factorial of a number in PROLOG language.	Understand	4
3	Correlate the importance of logic programming languages over functional programming languages.	Analyze	5
4	List the merits and demerits of subprogram level concurrency.	Knowledge	5
5	Discuss C++ parameterized ADT with suitable example.	Understand	5
6	Explain about Exception Propagation.	Understand	4

S. No	Question	Blooms Taxonomy Level	Course Outcome
7	Discuss various applications of logic programming languages.	Understand	4
8	Explain the concept of object oriented programming in Smalltalk.	Understand	4
9	Give an example for exception handlers in Ada language.	Understand	5
10	Explain the design issues related to Data abstraction	Understand	5
UNIT - V			
1	Write features of Haskell that makes very different from schema.	Apply	6
2	List the ways in which ML is significantly different from scheme.	Knowledge	6
3	Record the advantages of Python scripting language over other scripting languages	Knowledge	7
4	Give example of Python code to find the roots of quadratic equation	Understand	7
5	Discuss the concept of pragmatics in scripting languages.	Understand	7
6	Write the python code to print first ten natural numbers.	Apply	6
7	Write the python code to print factorial of a given number.	Apply	6
8	Write the python code to print prime numbers between the given range.	Apply	7
9	Write the python code to find the given number is even or odd.	Apply	7
10	Write the python code to print Pascal triangle.	Apply	7

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