

VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF GENERAL ENGINEERING

QUESTION BANK



B.E I SEMESTER

GE8151- Problem Solving and Python Programming

(Regulation – 2017)

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Prepared by

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Unit 1- ALGORITHMIC PROBLEM SOLVING

SYLLABUS

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

Part A

Q. No.	Questions	Competence	BT Level
1.	Point out any 5 programming language.	Analyze	BTL 4
2.	Define algorithm.	Remember	BTL 1
3.	Distinguish between pseudocode and flowchart.	Understand	BTL 2
4.	Define Control flow statement with an example.	Remember	BTL 1
5.	Describe Recursion.	Understand	BTL 2
6.	Discover the concept of towers of Hanoi.	Apply	BTL3
7.	Explain list.	Analyze	BTL 4
8.	Explain Iteration.	Evaluate	BTL 5
9.	Define simple computational problem.	Remember	BTL 1
10.	Write an algorithm to accept two numbers, compute the sum and print the result.	Evaluate	BTL 5
11.	What is meant by sorting? Mention its types.	Remember	BTL 1
12.	Develop an algorithm to convert Temperature in Celsius to Fahrenheit and vice versa.	Create	BTL 6
13.	Define Programming language.	Remember	BTL 1
14.	Identify the function types.	Remember	BTL1
15.	Examine a simple program to print the integer number from 1 to 50.	Apply	BTL 3
16.	Discuss building blocks of an algorithm.	Understand	BTL 2
17.	Discover the steps of simple strategies for developing algorithm.	Apply	BTL 3
18.	Differentiate user defined function and pre-defined function.	Create	BTL 6
19.	Analyze the notations used in algorithmic problem solving.	Analyze	BTL 4
20.	Describe some example for recursion function.	Understand	BTL 2

Part B

1.	Explain the algorithm of GCD and find LCM.	Analyze	BTL 4
2.	Discuss with suitable examples: i) Find minimum in a list ii) Find maximum in a list	Understand	BTL 2
3.	i) Summarize the advantages and disadvantages of flowchart. ii) Summarize the symbol used in flowchart.	Evaluate	BTL 5
4.	Describe an algorithm for the following. i) Prime number or not ii) Odd or even	Remember	BTL 1
5.	Explain the rules for pseudocode and uses of keywords.	Apply	BTL 3

6.	Explain the following programming language i) Machine language ii) Assembly language iii) High level language	Apply	BTL 3
7.	With neat sketch explain the following building blocks of algorithm i) Statements ii) Control flow	Create	BTL 6
8.	Describe the algorithm of towers of Hanoi problem. Suggest a solution to the tower of Hanoi problem with relevant diagram.	Remember	BTL 1
9.	Draw a flowchart to accept three distinct numbers, find the greatest and print the result.	Understand	BTL 2
10.	i) Describe pseudocode for Fibonacci sequence ii) Draw a flowchart for factorial of given number	Remember	BTL 1
11.	i) Describe the program to insert an element in a sorted list. ii) Draw the flowchart to find the sum of series $1+2+3+4+\dots+100$	Remember	BTL 1
12.	Summarize the difference between algorithm, flowchart and pseudocode.	Understand	BTL 2
13.	Explain algorithmic problem solving technique in detail.	Analyze	BTL 4
14.	Explain program development life cycle	Analyze	BTL 4

Unit 2 - DATA, EXPRESSIONS, STATEMENTS

SYLLABUS

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

Part A

Q. No.	Questions	Competence	BT Level
1.	Define the two modes in Python.	Remember	BTL 1
2.	Give the various data types in Python	Understand	BTL 2
3.	Point out the rules to be followed for naming any identifier	Analyze	BTL 4
4.	Assess a program to assign and access variables	Evaluate	BTL 5
5.	Compose the importance of indentation in Python	Create	BTL 6
6.	Select and assign how an input operation was done in Python.	Evaluate	BTL 5
7.	Demonstrate the various operations in Python	Apply	BTL 3
8.	Discover the difference between logical and bitwise operator.	Apply	BTL 3
9.	What is a tuple? How literals of type tuple are written? Give examples.	Understand	BTL 2
10.	Give the operator precedence in Python.	Understand	BTL 2
11.	Define the scope and lifetime of a variable in Python.	Remember	BTL 1
12.	Point out the uses of default arguments in Python.	Analyze	BTL 4
13.	Generalize the uses of Python module.	Create	BTL 6
14.	Demonstrate how a function calls another function. Justify your answer.	Apply	BTL 3
15.	List the syntax for function call with and without arguments	Remember	BTL 1
16.	Define recursive function	Remember	BTL 1
17.	Define the syntax for passing arguments	Remember	BTL 1
18.	What are the two parts of function definition. Give its syntax.	Remember	BTL 1
19.	Point out the difference between recursive and iterative technique.	Remember	BTL 1
20.	Give the syntax for variable length arguments.	Understand	BTL 2

Part B

1.	i) Illustrate a program to display different data types using variables and literals constants. ii) Show how an input and output function is performed in Python with an example.	Apply	BTL 3
2.	Explain in detail about the various operators in python with suitable examples.	Evaluate	BTL 5
3.	i) Discuss the difference between tuples and list	Understand	BTL 2

	ii)	Discuss the various operation that can be performed on a tuple and lists (minimum 5) with an example program		
4.	i) ii)	What is a numeric literal? Give examples. Describe the arithmetic operators in Python with an example.	Remember	BTL 1
5.		Demonstrate the various expressions in Python with suitable examples.	Apply	BTL 3
6.	i) ii)	What is membership and identity operators. Write a program to perform addition, subtraction, multiplication, integer division, floor division and modulo division on two integer and float.	Remember	BTL 1
7.	i) ii) iii)	Formulate the difference between type casting and type coercion with suitable example. Write a program to print the digit at ones place and hundreds place of a number. Write a program to convert temperature in degree Fahrenheit to Celsius.	Create	BTL 6
8.	i) ii)	Discuss the need and importance of function in Python. Illustrate a program to exchange the value of two variables with temporary variables	Understand	BTL 2
9.		Briefly discuss in detail about function prototyping in python with suitable example program.	Understand	BTL 2
10.	i) ii)	Analyze the difference between local and global variables. Explain with an example program to circulate the values of n variables.	Analyze	BTL 4
11.	i) ii)	Describe in detail about lambda functions or anonymous function. Describe in detail about the rules to be followed while using lambda function.	Remember	BTL 1
12.	i) ii)	Explain with an example program to return the average of given number passed as argument to a function. Explain the various features of functions in Python	Analyze	BTL 4
13.	i) ii)	Describe the syntax and rules involved in the return statement in Python. Write a program to demonstrate the flow of control after the return statement in Python.	Remember	BTL 1
14.	i) ii) iii)	Explain the operator precedence of arithmetic operators in Python. Write a Python program to exchange the value of two variables Write a Python program using function to find the sum of first 'n' even numbers and print the result.	Analyze	BTL 4

Unit 3 - CONTROL FLOW, FUNCTIONS

SYLLABUS

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

Part A

Q. No.	Questions	Competence	BT Level
1.	Analyze different ways to manipulate strings in Python.	Analyze	BTL 4
2.	Write the syntax of if and if-else statements.	Remember	BTL 1
3.	List our the applications of arrays.	Remember	BTL 1
4.	Discuss about continue and pass statements.	Understand	BTL 2
5.	What will be the output of print(str[2:5]) if str='hello world!'?	Remember	BTL 1
6.	Give the use of return() statement with a suitable example.	Understand	BTL 2
7.	Write a program to iterate a range using continue statement.	Remember	BTL 1
8.	Name the type of Boolean operators.	Understand	BTL 2
9.	Explain about break statement with an example.	Understand	BTL 2
10.	Where does indexing starts in Python?	Remember	BTL 1
11.	Illustrate the flowchart of if-elif-else statements.	Apply	BTL 3
12.	Describe any 4 methods used on a string.	Apply	BTL 3
13.	What are the advantages and disadvantages of recursion function?	Apply	BTL 3
14.	Explain the significance of for loop with else in an example.	Evaluate	BTL 5
15.	Define array with an example.	Remember	BTL 1
16.	Differentiate for loop and while loop.	Analyze	BTL 4
17.	Classify global variable with local variable.	Analyze	BTL 4
18.	Write a Python program to accept two numbers, multiply them and print the result.	Evaluate	BTL 5
19.	Justify the effects of slicing operation on an array.	Create	BTL 6
20.	How to access the elements of an array using index.	Create	BTL 6

Part B

1.	i) Write a Python program to find the sum of N natural numbers. ii) What is the use of pass statement? Illustrate with an example.	Remember	BTL 1
2.	i) Define methods in a string with an example program using atleast 5 methods. ii) How to access characters of a string?	Remember	BTL 1
3.	Write a program for binary search using Arrays.	Remember	BTL 1
4.	What is call by value and call by reference and explain it with suitable example	Remember	BTL 1
5.	i) Write a python program to find the given	Understand	BTL 2

	<p>number is odd or even.</p> <p>ii) Explain with an example – while loop, break statement and continue statement in Python.</p>		
6.	<p>i) Write a Python program to count the number of vowels in a string provided by the user.</p> <p>ii) Explain the types of function arguments in Python</p>	Understand	BTL 2
7.	<p>Explain the syntax and flowchart of the following loop statements</p> <p>i) for loop</p> <p>ii) while loop</p>	Understand	BTL 2
8.	<p>i) Illustrate with an example nested if and elif header in Python.</p> <p>ii) Develop a program to find the largest among three numbers.</p>	Apply	BTL 3
9.	<p>Explain recursive function. How do recursive function works?</p>	Apply	BTL 3
10.	<p>i) Create a Python program to find the given year is leap year or not.</p> <p>ii) Investigate on mutability and immutability in Python.</p>	Analyze	BTL 4
11.	<p>i) Explain the different types of the function prototype with an example.</p> <p>ii) Examine a Python program to generate first 'N' Fibonacci numbers. Note: The Fibonacci numbers are 0,1,1,2,3,5,8,..... where each number is the sum of preceding two.</p>	Analyze	BTL 4
12.	<p>i) Generate a program that uses lambda function to multiply two numbers.</p> <p>ii) Discuss the methods to manipulate the arrays in Python.</p>	Analyze	BTL 4
13.	<p>Explain the significance of xrange() function in for loop with a help of a program.</p>	Evaluate	BTL 5
14.	<p>i) Create a program to find the factorial of given number without recursion and with recursion.</p> <p>ii) Illustrate the concept of local and global variables.</p>	Create	BTL 6

Unit 4 - LISTS, TUPLES, DICTIONARIES

SYLLABUS

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: selection sort, insertion sort, merge sort, Histogram.

Part A

Q. No.	Questions	Competence	BT Level
1.	Define Python list. How lists differ from Tuples.	Remember	BTL 1
2.	What are the list operations?	Remember	BTL 1
3.	What are the different ways to create a list?	Remember	BTL 1
4.	Illustrate negative indexing in list with an example.	Apply	BTL 3
5.	How to slice a list in Python?	Understand	BTL 2
6.	List out the methods that are available with list object in Python programming.	Remember	BTL 1
7.	Show the membership operators used in list.	Apply	BTL 3
8.	Define Python Tuple.	Remember	BTL 1
9.	What are the advantages of Tuple over list?	Understand	BTL 2
10.	Classify the Python accessing elements in a Tuples.	Apply	BTL 3
11.	Point out the methods used in Tuples	Analyze	BTL 4
12.	How a Tuple is iterated? Explain with an example.	Analyze	BTL 4
13.	Explain how Tuples are used as return values?	Evaluate	BTL 5
14.	Define dictionary with an example.	Remember	BTL 1
15.	What are the properties of dictionary keys?	Understand	BTL 2
16.	Can you use the addition assignment operator, +=, with two lists? What is the result?	Evaluate	BTL 5
17.	Perform the bubble sort on the elements 23,78,45,8,32,56	Create	BTL 6
18.	Compose an example on insertion sort.	Create	BTL 6
19.	What is the use of all(), any(), cmp() and sorted() in dictionary?	Understand	BTL 2
20.	Differentiate between Tuples and dictionaries	Analyze	BTL 4

Part B

1.	i) What is Python List? Describe the list usage with suitable examples. ii) Write a program to illustrate the heterogeneous list.	Remember	BTL 1
2.	Describe the following i) Creating the list ii) Accessing values in the lists iii) Updating the list iv) Deleting the list elements	Remember	BTL 1
3.	i) Explain the basic list operations in detail with necessary programs. ii) Write a Python program to multiply two matrices.	Analyze	BTL 4
4.	i) Discuss the Python list methods with examples. ii) Why it is necessary to have both the functions	Understand	BTL 2

	<p>append and extend? What is the result of the following expression that uses append where it probably intended to use extend?</p> <pre>>>>lst=[1,2,3] >>>lst.append([4,5,6])</pre>		
5.	<p>i) Illustrate List comprehension with suitable examples</p> <p>ii) Write a Python program to concatenate two lists.</p>	Apply	BTL 3
6.	<p>i) What is a Python Tuple? What are the advantages of Tuple over list?</p> <p>ii) “Tuples are immutable”. Explain with example.</p>	Remember	BTL 1
7.	Illustrate the ways of creating the Tuple and the Tuple assignment with suitable programs.	Apply	BTL 3
8.	What are the accessing elements in a Tuple? Explain with suitable programs.	Remember	BTL 1
9.	<p>i) Explain the basic Tuple operations with examples.</p> <p>ii) Write a program to check whether an element ‘y’ and ‘a’ belongs to the tuple My_tuple = (‘p’, ‘y’, ‘t’, ‘h’, ‘o’, ‘n’) and after printing the result, delete the Tuple.</p>	Analyze	BTL 4
10.	<p>i) Describe the built in functions with Tuples.</p> <p>ii) Write a program to use Max(), Min() and sorted() methods in Tuple.</p>	Understand	BTL 2
11.	<p>i) Discuss a)Tuples as return values b) Variable Length Argument Tuples</p> <p>ii) Write a program to illustrate the comparison operators in Tuple.</p>	Understand	BTL 2
12.	<p>i) Write a Python program to perform linear search on a list.</p> <p>ii) Write a Python program to store ‘n’ numbers in a list and sort the list using selection sort.</p>	Evaluate	BTL 5
13.	<p>i) Explain the properties of Dictionary keys with examples.</p> <p>ii) Explain the operations for dynamically manipulating dictionaries.</p>	Analyze	BTL 4
14.	Write a Python program named weather that is passed a dictionary of daily temperatures and returns the average temperature over the weekend for the weekly temperatures given.	Create	BTL 6

Unit 5 - FILES, MODULES, PACKAGES			
SYLLABUS			
Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.			
Part A			
Q. No.	Questions	Competence	BT Level
1.	Point out different modes of file opening.	Analyze	BTL 4
2.	Define the access modes	Remember	BTL 1
3.	Distinguish between files and modules.	Understand	BTL 2
4.	Define read and write file	Remember	BTL 1
5.	Describe renaming and delete.	Understand	BTL 2
6.	Discover the format operator available in files.	Apply	BTL 3
7.	Explain with example the need for exceptions.	Analyze	BTL 4
8.	Explain Built-in exceptions.	Evaluate	BTL 5
9.	Difference between built-in exceptions and handling exception	Remember	BTL 1
10.	Write a program to write a data in a file for both write and append modes.	Evaluate	BTL 5
11.	How to import statements?	Remember	BTL 1
12.	Express about namespace and scoping	Create	BTL 6
13.	Differentiate global and local	Remember	BTL 1
14.	Identify what are packages in Python.	Remember	BTL 1
15.	Examine buffering	Apply	BTL 3
16.	Discuss file.isatty[]	Understand	BTL 2
17.	Discover except Clause with Multiple exception	Apply	BTL 3
18.	Create a Python script to display the current date and time.	Create	BTL 6
19.	Analyze the object as return values.	Analyze	BTL 4
20.	Discuss a modular design	Understand	BTL 2
Part B			
1.	Write a Python program to demonstrate the file I/O operations.	Analyze	BTL 4
2.	Discuss the different modes for opening a file and closing a file.	Understand	BTL 2
3.	i) Write a program to catch a divide by zero exception. Add a finally block too. ii) Write a function to print the hash of any given file in Python.	Evaluate	BTL 5
4.	i) Describe the use of try block and except block in python with syntax. ii) Describe with an example exceptions with arguments in python.	Remember	BTL 1
5.	i) Explain with example of writing a file ii) Discover syntax for reading from a file	Apply	BTL 3
6.	i) Structure Renaming a file ii) Explain about the files related methods	Create	BTL 6

7.	i) Describe the import statements ii) Describe the from...import statements	Remember	BTL 1
8.	Describe in detail locating modules.	Understand	BTL 2
9.	Identify the various methods used to delete the elements from the dictionary	Remember	BTL 1
10.	Describe in detail exception handling with sample program	Remember	BTL 1
11.	Write a program to find the one's complement of binary number using file.	Create	BTL 6
12.	Write a program to display a pyramid	Create	BTL 6
13.	Write a program to find the number of instances of different digits in a given number	Remember	BTL 1
14.	Describe in detail printing to the screen.	Create	BTL 6