

# VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING QUESTION BANK



**B.E I SEMESTER**

**GE8151- Problem Solving and Python Programming**

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**Unit -I****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**

<b>Q.No</b>	<b>Questions</b>	<b>Competence</b>	<b>BT Level</b>
1	<b>Point</b> out any 5 programming language	Analyze	BTL 4
2	<b>Define</b> an algorithm	Remember	BTL 1
3	<b>Distinguish</b> between pseudo code and flowchart.	Understand	BTL 2
4	<b>Define</b> control flow statement with an eg:	Remember	BTL 1
5	<b>Describe</b> recursion.	Understand	BTL 2
6	<b>Discover</b> the concept of towers of Hanoi.	Apply	BTL3
7	<b>Explain</b> list	Analyze	BTL 4
8	<b>Explain</b> Iteration	Evaluate	BTL 5
9	<b>Define</b> simple computational problem	Remember	BTL 1
10	<b>Assess</b> problem solving method.	Evaluate	BTL 5
11	<b>What</b> is meant by sorting ? mention its types	Remember	BTL 1
12	<b>Develop</b> algorithm for Celsius to Fahrenheit and vice versa	Create	BTL 6
13	<b>Define</b> programming language	Remember	BTL 1
14	<b>Identify</b> the function types	Remember	BTL1
15	<b>Examine</b> a simple program to print the integer number from 1 to 50	Apply	BTL 3
16	<b>Discuss</b> building blocks of algorithm	Understand	BTL 2
17	<b>Discover</b> the steps of simple strategies for developing algorithms.	Apply	BTL 3
18	<b>Differentiate</b> user defined function and predefined function	Create	BTL 6
19	<b>Analyze</b> the notations used in algorithmic problem solving	Analyze	BTL 4
20	<b>Describe</b> some example for recursion function	Understand	BTL 2
<b>PART-B (13 MARK )</b>			
1	<b>Explain</b> the algorithm GCD and find LCM	Analyze	BTL 4
2	<b>Discuss</b> with suitable examples i)Find minimum in a list	Understand	BTL 2

	ii) Find Maximum in a list		
3	i) <b>Summarize</b> advantage and disadvantage of flow chart ii) <b>Summarize</b> the symbol used in flow chart	Evaluate	BTL 5
4	<b>Describe</b> Build an algorithm for the following (i) Prime number or not (ii) odd or even	Remember	BTL 1
5	<b>Explain</b> the rules for pseudo code and uses of keywords	Apply	BTL 3
6	<b>Explain</b> the following programming language i). Machine language ii). Assembly language iii). High level language	Apply	BTL 3
7	<b>Neat sketch</b> explain the following building blocks of alg. i). Statements ii). Control Flow	Create	BTL 6
8	<b>Describe</b> State and function in Building Block and examples.	Remember	BTL 1
9	<b>Draw</b> a flow chart print all prime number between to intervals	Understand	BTL 2
10	i). <b>Describe</b> pseudo code for Fibonacci sequence using ii). <b>Draw</b> a flow chart for factorial given number (3*3)	Remember	BTL 1
11	i). <b>Describe</b> the program to insert an element in a sorted list ii). <b>Draw</b> the flow chart sum of n numbers	Remember	BTL 1
12	i). <b>Summarize</b> the difference between algorithm, flow chart and pseudo code	Understand	BTL 2
13	(i). <b>Explain</b> algorithmic problem solving technique in detail.	Analyze	BTL 4
14	<b>Explain</b> program life cycle	Analyze	BTL 4
<b>PART - C (15 MARK )</b>			
1	<b>What</b> is pseudo code? Explain how it can be designed and write benefits and limitations.	Create	BTL 6
2	<b>Explain</b> guidelines for preparing flowcharts, benefits and limitation of flowcharts and preparing flow chart for quadratic equation	Analyze	BTL 4
3	<b>Describe</b> the algorithm for finding sum and average of n numbers. Also state the properties of a good algorithm	Remember	BTL 1
4	<b>Describe</b> the algorithm of towers of honai problem.	Remember	BTL 1

**Unit -II****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**

<b>Q.No</b>	<b>Questions</b>	<b>Competence</b>	<b>BT Level</b>
1	<b>Define</b> the two modes in Python.	Remember	BTL1
2	<b>Give</b> the various data types in Python.	Understand	BTL2
3	<b>Point Out</b> the rules to be followed for naming any identifier.	Analyze	BTL4
4	<b>Assess</b> a program to assign and access variables.	Evaluate	BTL5
5	<b>Compose</b> the importance of indentation in python.	Create	BTL6
6	<b>Select</b> and assign how an input operation was done in python.	Evaluate	BTL5
7	<b>Demonstrate</b> the various operators in python.	Apply	BTL3
8	<b>Discover</b> the difference between logical and bitwise operator.	Apply	BTL3
9	<b>Give</b> the reserved words in Python.	Understand	BTL2
10	<b>Give</b> the operator precedence in python.	Understand	BTL2
11	<b>Define</b> the scope and lifetime of a variable in python.	Remember	BTL1
12	<b>Point out</b> the uses of default arguments in python.	Analyze	BTL4
13	<b>Generalize</b> the uses of python module.	Create	BTL6
14	<b>Demonstrate</b> how a function calls another function. Justify your answer.	Apply	BTL3
15	<b>List</b> the syntax for function call with and without arguments.	Remember	BTL1
16	<b>Define</b> recursive function.	Remember	BTL1
17	<b>Define</b> the syntax for passing arguments.	Remember	BTL1
18	<b>What</b> are the two parts of function definition give the syntax	Remember	BTL1
19	<b>Point out</b> the difference between recursive and iterative technique.	Remember	BTL1
20	<b>Give</b> the syntax for variable length arguments.	Understand	BTL2

**PART-B (13 MARK )**

1	<p>i) <b>Illustrate</b> a program to display different data types using variables and literal constants.</p> <p>ii) <b>Show</b> how an input and output function is performed in python with an example.</p>	Apply	BTL3
2	<b>Explain</b> in detail about the various operators in python with suitable examples.	Evaluate	BTL5
3	<p>i) <b>Discuss</b> the difference between tuples and list</p> <p>ii) <b>Discuss</b> the various operation that can be performed on a tuple and Lists (minimum 5) with an example program.</p>	Understand	BTL2
4	<p>i) <b>How</b> the area of circle is calculated explain with an example.</p> <p>ii) <b>Describe</b> a program to calculate student result based on two examinations, one sports event and three activities conducted. The weightage of the activity = 30%, sports =20%, and examination=50%</p>	Remember	BTL1
5	<b>Demonstrate</b> the various expressions in python with suitable examples.	Apply	BTL3
6	<p>i) <b>What</b> is membership and identity operators.</p> <p>ii) <b>Write</b> a program to perform addition, subtraction, multiplication, integer division, floor division and modulo division on two integer and float.</p>	Remember	BTL1
7	<p>i) <b>Formulate</b> the difference between type casting and type coercion with suitable example</p> <p>ii) Write a program to print the digit at ones place and hundreds place of a number.</p> <p>iii) Write a program to convert degree Fahrenheit to Celsius</p>	Create	BTL6
8	<p>i) Discuss the need and importance of function in python.</p> <p>ii) Illustrate a program to exchange the value of two variables with temporary variables</p>	Understand	BTL2
9	<b>Briefly</b> discuss in detail about function prototyping in python. With suitable example program	Understand	BTL2
10	<p>i) <b>Analyze</b> the difference between local and global variables.</p> <p>ii) <b>Explain</b> with an example program to circulate the values of n</p>	Analyze	BTL4

	variables.		
11	<b>i) Describe</b> in detail about lambda functions or anonymous function. <b>ii) Describe</b> in detail about the rules to be followed while using Lambda function.	Remember	BTL1
12	<b>i) Explain</b> with an example program to return the average of its argument <b>ii) Explain</b> the various features of functions in python.	Analyze	BTL4
13	<b>i) Describe</b> the syntax and rules involved in the return statement in python <b>ii) Write</b> a program to demonstrate the flow of control after the return statement in python	Remember	BTL1
14	<b>i) Analyze</b> with a program to find out the distance between two points using python. <b>ii) Write</b> a program to calculate the simple interest using python.	Analyze	BTL4
PART - C (15 MARK )			
1	<b>Explain</b> how to write and execute a program in python illustrate the steps for writing a python program to check whether the number is palindrome or not.	Analyze	BTL4
2	<b>i) Formulate</b> with an example program to pass the list arguments to a function <b>(ii) Write</b> a program to perform selection sort from a list of numbers using python	Create	BTL6
3	Do the Case study and <b>perform</b> the following operation in tuples i) Maxima ii) minima iii) sum of two tuples iv) duplicate a tuple v) slicing operator vi) obtaining a list from a tuple vii) Compare two tuples viii) printing two tuples of different data types	Evaluate	BTL5
4	<b>i) Formulate</b> with an example program to find out all the values in the list that are greater than the specified number. <b>ii) Write</b> a program to find out the square root of two numbers	Create	BTL6

**Unit -III****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**

<b>Q.No</b>	<b>Questions</b>	<b>Competence</b>	<b>BT Level</b>
1	Analyze different ways to manipulate strings in python.	Analyzing	BTL 4
2	Write the syntax of if and if-else statements.	Remembering	BTL 1
3	List out the applications of arrays.	Remembering	BTL 1
4	Discuss about continue and pass statements.	Understanding	BTL 2
5	What will be the output of print str[2:5] if str='hello world!'?	Remembering	BTL 1
6	Give the use of return () statement with a suitable example.	Understanding	BTL 2
7	Write a program to iterate a range using continue statement.	Remembering	BTL 1
8	Name the type of Boolean operators.	Understanding	BTL 2
9	Explain about break statement with an example.	Understanding	BTL 2
10	Where does indexing starts in python?	Remembering	BTL 1
11	Illustrate the flow chart of if-elif- else statements	Applying	BTL 3
12	Describe various methods used on a string. (Any Four)	Applying	BTL 3
13	What are the advantages and disadvantages of recursion function?	Applying	BTL 3
14	Explain the significance of for loop with else in an example.	Evaluating	BTL 5
15	Define array with an example.	Remembering	BTL 1
16	Differentiate for loop and while loop.	Analyzing	BTL 4
17	Classify global variable with local variable	Analyzing	Analyzing
18	Summarize string modules	Evaluating	BTL-5

19	Justify the effects of slicing operations on an array	Creating	BTL-6
20	How to access the elements of an array using index?	Creating	BTL-6
<b>PART-B (13 MARK )</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.	Remembering	BTL 1
2	(i) Define methods in a string with an example program using at least five methods. (ii) How to access characters of a string?	Remembering	BTL 1
3	Write a program for binary search using Arrays	Remembering	BTL 1
4	What is call by value and call by reference and explain it with suitable Example	Remembering	BTL 1
5	(i). Write a python program to find the given number is odd or even (ii). Explain break and continue statement with the help of for loop in an example.	Understanding	BTL 2
6	(i). Write a python program to count the number of vowels in a string provided by the user. (ii). Explain the types of function arguments in python	Understanding	BTL 2
7	Explain the syntax and flow chart of the following loop statements (i) for loop (ii) while loop	Understanding	BTL 2
8	(i). Illustrate the flow chart and syntax of if-elif- else statements (ii). Develop a program to find the largest among three numbers	Applying	BTL 3
9	(i). Explain recursive function. How do recursive function works? Explain with a help of a program	Applyin	BTL 3
10	(i). Create a python program to find the given year is leap or not (ii). Investigate on mutability and immutability in python	Analyzing	BTL 4
11	(i) Explain the different types of the function prototype with an example (ii). Examine the program on Fibonacci series	Analyzing	BTL 4
12	(i). Generate a program that uses lambda function to multiply two numbers (ii). Discuss the methods to manipulate the arrays in python	Analyzing	BTL 4
13	Explain the significance of xrange() function in for loop with a help of a program	Evaluating	BTL 5
14	(i). Create a program to reverse a string without using recursion (ii). Illustrate the concept of local and global variables	Creating	BTL 6



PART - C (15 MARK)			
1	Write a python program to design simple calculator performing arithmetic functions like addition, subtraction, multiplication and division with the input given by user	Evaluating	BTL 5
2	Create a program for linear search using Arrays	Creating	BTL 6
3	(i) Illustrate a program to find GCD of m and n. (ii) How to find the square root of a number using newton's method	Evaluating	BTL 5
4	(i) Write a python program to sum an array of numbers ii) Create a program to print the following pattern  <div style="text-align: center;">           1            1 2 1            12321            1234321         </div>	Creating	BTL 6

### Unit -IV

#### 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.	Remembering	BTL1
2	What are the list operations?	Remembering	BTL1
3	What are the different ways to create a list?	Remembering	BTL1
4	Illustrate negative indexing in list with an example.	Applying	BTL3
5	Describe list slicing with examples.	Understanding	BTL2
6	List out the methods that are available with list object in python programming	Remembering	BTL1

7	Show the membership operators used in list.	Applying	BTL3
8	Define Python tuple.	Remembering	BTL1
9	What are the advantages of tuple over list?	Understanding	BTL2
10	Classify the Python accessing Elements in a tuples.	Applying	BTL3
11	Point out the methods used in tuples.	Analysing	BTL4
12	How a tuple is iterated? Explain with an example.	Analysing	BTL4
13	Explain how tuples are used as return values?	Evaluating	BTL5
14	Define dictionary with an example.	Remembering	BTL1
15	What are the properties of dictionary keys?	Understanding	BTL2
16	Can you use the addition assignment operator, +=, with two lists? What is the result?	Evaluating	BTL5
17	Perform the bubble sort on the elements 23,78,45,8,32,56.	Creating	BTL6
18	Compose an example on insertion sort.	Creating	BTL6
19	What is the use of all(), any(), cmp() and sorted() in dictionary?	Understanding	BTL2
20	Differentiate between tuples and dictionaries.	Analysing	BTL4
<b>PART-B (13 MARK )</b>			
1	(i) What is python List ?Describe the List usage with suitable examples (ii) Write a program to illustrate the heterogeneous list.	Remembering	BTL1
2	Describe the following a) Creating the List b) Accessing values in the Lists c) Updating the Lists d) Deleting the list Elements	Remembering	BTL1
3	(i) Explain the basic List Operations in details with necessary programs (ii) Write a Python program to multiply two Matrices	Analysing	BTL4
4	(i) Discuss the Python List Methods with examples (ii) Why it is necessary to have both the functions append and Extend? What is the result of the following expression that uses. Append where it probably intended to use extend? >>> lst = [1, 2, 3] >>> lst.append([4, 5, 6])	Understanding	BTL2

5	(i) Illustrate List Comprehension with suitable examples (ii) Write a python program to concatenate two lists	Applying	BTL3
6	(i)What is a Python Tuple? What are the Advantages of Tuple over List? (ii) “Tuples are immutable”. Explain with Examples.	Remembering	BTL1
7	Illustrate the ways of creating the tuple and the tuple assignment with suitable programs	Applying	BTL3
8	What are the accessing elements in a tuple? Explain With suitable Programs.	Remembering	BTL1
9	(i)Explain the basic Tuple Operations with examples (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.	Analysing	BTL4
10	(i) Describe the built in functions with tuples. (ii) Write a program to use Max(), Min() and sorted() methods in tuple	Understanding	BTL2
11	(i)Discuss a)Tuples as return values b)Variable Length Argument Tuples (ii) Write a program to illustrate the comparison operators in tuple	Understanding	BTL2
12	A polygon can be represented by a list of (x, y) pairs where each pair is a tuple: [(x1, y1), (x2, y2), (x3, y3) , ... (xn, yn)]. Write a Recursive function to compute the area of a polygon. This can be accomplished by “cutting off” a triangle, using the Exploring Python– Chapter 4 - Strings, Lists and Tuples 24 fact that a triangle withcorners (x1, y1), (x2, y2), (x3, y3) has area $(x_1y_1 + x_2y_2 + x_3y_2 - y_1x_2 - y_2x_3 - y_3x_1) / 2$ .	Evaluating	BTL5
13	(i)Explain the properties of Dictionary keys with examples (ii) Illustrate the python Dictionary Comprehension with	Analysing	BTL4

	examples		
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.	Creating	BTL6
<b>PART - C (15 MARK)</b>			
1	Create a python program to perform selection sort on the elements Read from the user.	Creating	BTL6
2	Write a program that uses insertion sort technique to sort an array of 10 elements	Evaluating	BTL 5
3	Explain in detail about (i) Creating a dictionary (ii) Accessing values in a dictionary (iii) Updating dictionary (iv) Deleting elements from dictionary	Evaluating	BTL 5
4	(i) Write a Python program to create a histogram from a given list of integers.  (ii) Perform merge sort on a given list of elements	Creating BTL6	BTL6 Creating

**Unit -V****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	<b>Point</b> out different modes of file opening	Analyze	BTL4
2	<b>Define</b> the access modes	Remember	BTL1
3	<b>Distinguish</b> between files and modules.	Understand	BTL2
4	<b>Define</b> read and write file.	Remember	BTL1
5	<b>Describe</b> renaming and delete.	Understand	BTL2
6	<b>Discover</b> the format operator available in files.	Apply	BTL3

7	<b>Explain</b> with example the need for exceptions.	Analyze	BTL4
8	<b>Explain</b> built in exceptions	Evaluate	BTL5
9	<b>Difference</b> between built in exceptions and handling exception	Remember	BTL1
10	<b>Write</b> a program to write a data in a file for both write and append modes.	Evaluate	BTL5
11	<b>How</b> to import statements?	Remember	BTL1
12	<b>Express</b> about namespace and scoping.	Create	BTL6
13	<b>Difference</b> between global and local.	Remember	BTL1
14	<b>Identify</b> what are the packages in python	Remember	BTL1
15	<b>Examine</b> buffering.	Apply	BTL3
16	<b>Discuss</b> File.isatty[.].	Understand	BTL2
17	<b>Discover</b> except Clause with Multiple Exceptions.	Apply	BTL3
18	<b>Differentiate</b> mutable.	Create	BTL6
19	<b>Analyze</b> the object as return values.	Analyze	BTL4
20	<b>Describe</b> built – in class attribute.	Understand	BTL2
<b>PART-B (13 MARK )</b>			
1	<b>Write</b> a Python program to demonstrate the file I/O operations	Analyze	BTL4
2	<b>Discuss</b> with suitable examples i) Close a File. ii) Writing to a File.	Understand	BTL2
3	i) <b>Write</b> a program to catch a Divide by zero exception. Add a finally block too. ii) <b>Write</b> a function to print the hash of any given file in python	Evaluate	BTL5
4	(i) <b>Describe</b> in detail about Exception with Arguments (ii) <b>Describe</b> in detail about user – defined Exceptions.	Remember	BTL1
5	(i) <b>Explain</b> with example of closing a file (ii) <b>Discover</b> syntax for reading from a file	Apply	BTL3
6	i). <b>Structure</b> Renaming a file ii). <b>Explain</b> about the Files Related Methods.	Create	BTL6
7	i). <b>Describe</b> the import Statements ii). <b>Describe</b> the from...import statements	Remember	BTL1
8	<b>Describe</b> in detail locating modules	Understand	BTL2
9	<b>Identify</b> the various methods used to delete the elements from the dictionary	Remember	BTL1

10	<b>Describe</b> in detail exception handling with sample program	Remember	BTL1
11	<b>Write</b> a program to find the one's complement of binary number using file.	Create	BTL6
12	<b>Write</b> a program to display a pyramid	Create	BTL 6
13	<b>Write</b> a program to find the number of instances of different digits in a given number	Remember	BTL 1
14	<b>Describe</b> in detail printing to the screen.	Create	BTL 6
<b>PART - C (15 MARK )</b>			
1	<b>Generalize</b> a case study on the getting the students mark statements and analysis with exception handling	Create	BTL 6
2	<b>Write</b> a program to find n number from list using file handling	Create	BTL 6
3	<b>Analyze</b> the university result of various colleges in department wise using read and write file	Analyse	BTL 4
4	<b>Measure</b> to read random numbers upto 75 and display even and odd numbers with two different files.	Evaluate	BTL 5