SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattangulathur – 603 203

DEPARTMENT OF GENERAL ENGINEERING

QUESTION BANK

Academic Year 2024-2025

II SEMESTER

GE3231 - Problem Solving and Python Programming

(Regulation – 2023)

(AY: 2024 – 2025 EVEN SEMESTER)

UNIT 1

PYTHON BASICS

Introduction to Python – Literals – Variables and Identifiers – Data Types – Input Operation – Comments – Reserved words – Indentation – Operators and Expressions – Modes of python. Conditionals: Boolean values and operators - conditional if - alternative if - chained conditional - Iteration, Illustrative programs: Basic Arithmetic Operations, GCD of numbers, Square root (Newton's Method).

PART A

Sl.No	Questions	Competence	BT Level
1	List the various control flow structures	Remember	BTL 1
2	Define Python.	Understand	BTL 2
3	Differentiate between intermediate mode and script mode.	Analyze	BTL 4
4	Write the standard data types in Python.	Remember	BTL 1
5	Discuss different modes of operation in python.	Understand	BTL 2
6	Write a simple python program to perform addition of two values.	Apply	BTL3
7	Distinguish between string and list data types.	Analyze	BTL 4
8	Infer how does python interpreter work?	Evaluate	BTL 5
9	Write the rules for naming a variable.	Create	BTL 6
10	Evaluate the order of precedence of operators in python.	Evaluate	BTL 5
11	State Tuple Assignment.	Remember	BTL 1
12	Develop a simple python program using while loop	Create	BTL 6
13	Define Variable.	Remember	BTL 1
14	Show how Comment is used in python.	Remember	BTL1
15	What is data type in python?	Understand	BTL 2
16	State the reasons to divide program in to functions.	Evaluate	BTL 5
17	Mention the features of Python.	Analyze	BTL 4
18	What are keywords?	Understand	BTL 2
19	Classify expressions by applying different operators.	Apply	BTL 3
20	List the types of operators available in python.	Understand	BTL 2

PART B

1	Analyze the modes of interpreter and explain how python works in different modes.	Analyze	BTL 4
2	Evaluate the different values (data types) and types of values that can be used in Python.	Evaluate	BTL 5
3	Give the python code to find the minimum among the list of 10 numbers.	Understand	BTL 2

4	List the different operators in python and estimate the precedence of execution.	Remember	BTL 1
5	What is the use of function? Explain the role of function call and function definition with example.	Remember	BTL 1
6	List the types of operators in python and thus explain the different expressions involved in python.	Apply	BTL 3
7	Explain if-statement and if-else statement with example.	Remember	BTL 1
8	Analyze the need for functions and explain with example	Analyze	BTL 4
9	Write a simple program with and without recursion to calculate factorial of a number.	Apply	BTL 3
10	Write a Python program to find the square root of a number.	Remember	BTL 1
11	Write a python program to check whether a given year is a leap year or not.	Create	BTL 6
12	Explain the sequence data types in python with examples.	Evaluate	BTL 5
13	Discuss the various modes of Python Interpreter and explain with example.	Apply	BTL 3
14	Appraise with an example nested if and elif header in Python.	Understand	BTL 2
15	Explain the following. (i) Tuple assignment (ii) Comments (iii) Statements in python	Understand	BTL 2
16	(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.	Create	BTL 6
17	Design a simple calculator with python code by defining its different notations.	Create	BTL 6
18	(i) Create a program to reverse a string without using recursion. (ii) Illustrate the concept of local and global variables	Evaluate	BTL 5

UNIT 2

FUNCTIONS, LIST, TUPLES

Functions, function definition and use. Fruitful functions: return values, parameters, local and global scope, recursion. Lists: list operations, list slices, list methods, list loop, mutability, list parameters; Tuples: tuple assignment, tuple as return value. Comparison of Lists and tuples. Illustrative programs: exchange the values of two variables, square root, Linear and Binary search. Fibonacci series using functions.

PART A

Sl.No	Questions	Competence	BT Level
1	Define function and state its use.	Remember	BTL 1
2	Analyze the different kinds of arguments.	Analyze	BTL 4
3	Illustrate negative indexing in list with an example.	Evaluate	BTL 5
4	Analyze the need to divide a program into functions.	Analyze	BTL 4

5	Write a program to add two lists.	Create	BTL 6
6	Using the concept of functions, calculate the area of a circle.	Apply	BTL 3
7	Show how Tuples are used as return values?	Apply	BTL 3
8	What do you mean by fruitful function?	Understand	BTL 2
9	Illustrate negative indexing in list with an example.	Remember	BTL 1
10	Point out the methods that are available with list object.	Analyze	BTL 4
11	List any three built-in functions and its usage.	Understand	BTL 2
12	Write a function without argument and with return type.	Analyze	BTL 4
13	Differentiate local and global variables.	Apply	BTL 3
14	Evaluate the usage of tuple as arguments to a function.	Evaluate	BTL 5
15	Write the syntax for concatenating two lists in python.	Apply	BTL 3
16	Evaluate the difference between lists and tuples.	Evaluate	BTL 5
17	Define Python list.	Remember	BTL 1
18	Write the syntax for function definition.	Remember	BTL 1
19	What does sorting refer to?	Remember	BTL 1
20	Write a program to add two lists.	Create	BTL 6
PART B			
1	Describe the following (i) Creating the list (ii) Accessing values in the lists (iii) Updating the list (iv) Deleting the list elements	Evaluate	BTL 5
2	What does fruitful function refer to? How it can be used? Explain with an example.	Understand	BTL 2
3	Write the syntax and explain the concept of (i) Recursive function with an example. (ii) Linear search	Remember	BTL 1
4	List the different types of arguments / parameters used in function with suitable examples.	Remember	BTL 1
5	What is a Python Tuple? What are the advantages of Tuple over list? "Tuples are immutable". Explain with example.	Analyze	BTL 4
6	Illustrate the ways of creating the Tuple and the Tuple assignment with suitable programs.	Create	BTL 6
7	(i) What are the accessing elements in a Tuple? Explain with suitable programs. (ii). Explain how to return more than one value from a function with the help of a program.	Understand	BTL 2
8	(i). Explain the basic Tuple operations with examples. (ii). Illustrate a program to check whether an element 'y' and 'a' belongs to the tuple mytuple =('p','y','t','h','o',n') and after printing the result, delete the Tuple.	Understand	BTL 2
9	Describe the concept of binary search with suitable example and write python code to implement.	Evaluate	BTL 5

10	(i). Write a python program to find the greatest among three numbers. (ii). Write a program to check the given number is Armstrong number or not.	Understand	BTL 2
11	Describe the built in functions with Tuples and write a program to use Max(), Min() and sorted() methods in Tuple.	Analyze	BTL 4
12	What is function? How a function is defined and called in python? Explain with a simple program.	Remember	BTL 1
13	(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
14	(i) Write a Python program using function to find the sum of first 'n' even numbers and print the result. (ii) Write a python program to find the roots of the quadratic equation.	Analyze	BTL 4
15	Create a user defined fruitful function to test a given year is a leap year.	Create	BTL 6
16	Write a Python program to perform linear search and binary search.	Create	BTL 6
17	Write a python program to add tuple to list and vice versa.	Evaluate	BTL 5
18	Write a program to delete all the duplicate elements in a list.	Evaluate	BTL 5

UNIT 3

STRINGS, DICTIONARY, SET

Strings: string slices, immutability, string functions and methods, string module. Dictionaries: Operations (create, access, add, remove) and methods. (Insert, delete). Set operation (Access, Add, Remove). Illustrative programs: creates a dictionary of radius of a circle and its circumference.

PART A

Sl.No	Questions	Competence	BT Level
1	Define dictionary.	Remember	BTL 1
2	Examine different set functions.	Analyze	BTL 4
3	Write a simple python code to perform union, intersection and difference operation using set	Create	BTL 6
4	Write the syntax for creating a String variable in Python.	Apply	BTL 3
5	What does key value pair refer to?	Remember	BTL 1
6	What is set?	Remember	BTL 1
7	List the dictionary operations.	Remember	BTL 1
8	List the mutable data types and immutable data types	Remember	BTL 1
9	How to create and delete a dictionary?	Understand	BTL 2
10	Write a python program to manipulate strings.	Create	BTL 6
11	What will be the output of print(str[2:5]) if str='hello world!'?	Evaluate	BTL 5
12	How to add and remove data in set?	Understand	BTL 2
13	Describe any 4 methods used on a string.	Apply	BTL 3

14	What does D.item( ) returns? Give an example.	Apply	BTL 3
15	Write the syntax for concatenating two strings in python.	Apply	BTL 3
16	Write the usage of capitalize( ) and title( ) methods in string.	Apply	BTL 3
17	How does make a copy of dictionary using copy( ) method?	Analyze	BTL 4
18	How can you insert values into a dictionary?	Evaluate	BTL 5
19	What is the use of fromkeys( ) in dictionary?	Understand	BTL 2
20	Python strings are immutable. Comment on this statement.	Remember	BTL 1
PART B			
1	(i) Define methods in a string with an example program using at least 5 methods. (ii) How to access characters of a string?	Remember	BTL 1
2	Write a program to count the number of common characters in a pair of strings.	Apply	BTL 3
3	Describe the methods and operations of Dictionaries.	Remember	BTL 1
4	Write a Python program to count the number of vowels in a string provided by the user.	Understand	BTL 2
5	Write a program that takes a sentence as input from the user and computes the frequency of each letter. Use a variable of dictionary type to maintain the count.	Apply	BTL 3
6	Python strings are immutable. Justify with an example program.	Analyze	BTL 4
7	(i) Analyze string slicing. Illustrate how it is done in python with an example. (ii) Write a python code to search a string in the given list.	Analyze	BTL 4
8	Using the concept of dictionary, write a program to create a dictionary that calculates the frequency of words for a given text.	Remember	BTL 1
9	Describe set and explain its operations with suitable examples.	Understand	BTL 2
10	Describe different functions associated with sets.	Understand	BTL 2
11	Write a function that takes a string as a parameter and replaces the first letter of every word with the corresponding uppercase letter.	Evaluate	BTL 5
12	Write a Python program for adding elements to a dictionary.	Evaluate	BTL 5
13	How to remove items from set? Explain the methods used for it with example.	Understand	BTL 2
14	Recollect the various dictionary operations and explain them with an example.	Remember	BTL 1
15	Create a program to determine whether a string is a palindrome or not.	Create	BTL 6
16	(i) Write a function to find the number of common characters in two strings. (ii) Write a program to reverse a string.	Create	BTL 6
17	(i) Write a Python program to check if two given sets have no elements in common. (ii) Write a Python program to remove the intersection of a 2nd set from the 1st set.	Create	BTL 6
18	Evaluate and explain the different operations like union, intersection and differences in a Set with sample program.	Evaluate	BTL 5

UNIT 4

FILES, EXCEPTIONS, MODULES AND PACKAGES

Files and exception: Text Files, Reading and Writing files, Format operator; Errors and Exceptions, Handling Exceptions, Multiple Except blocks, Modules, Packages; Illustrative programs: word count, copy file, Creating user defined Exceptions.

PART A

Sl.No	Questions	Competence	BT Level
1	What are files? Why do we need them?	Analyze	BTL 4
2	Differentiate between a file and folder	Remember	BTL 1
3	Explain the significance of root node	Understand	BTL 2
4	List the different access modes to open a file	Remember	BTL 1
5	Differentiate between absolute and relative file path	Understand	BTL 2
6	Give the different methods to read data from a file	Apply	BTL 3
7	Write the syntax of read() method	Analyze	BTL 4
8	Differentiate between text and binary file.	Evaluate	BTL 5
9	What are logic errors? Give examples.	Remember	BTL 1
10	Distinguish between files and modules.	Evaluate	BTL 5
11	What are packages in python?	Remember	BTL 1
12	What are modules? How are they used in programs?	Create	BTL 6
13	List any three built-in exceptions with examples.	Remember	BTL 1
14	Differentiate between error and exception	Remember	BTL 1
15	Write the syntax of try-except block	Evaluate	BTL 5
16	How exceptions are handled in program?	Analyze	BTL 4
17	What is ‘value error’ in python?	Apply	BTL 3
18	What is base exception?	Understand	BTL 2
19	Examine the need for exception handling using an example.	Analyze	BTL 4
20	Define reading and writing a file.	Remember	BTL 1
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) Discover 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.	Analyze	BTL 4

4	(i) Describe the use of try block and except block in python with syntax. (ii)Describe with an example exception 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	Explain about the files related methods with example coding.	Analyze	BTL 4
7	Explain python modules and packages.	Remember	BTL 1
8	Write a program that will prompt the user for a string and a file name, and then print all lines in the file that contain the string. Also interpret the obtained result.	Evaluate	BTL 5
9	Describe in detail exception handling with sample program.	Remember	BTL 1
10	Illustrate a program to find the one's complement of binary number using file.	Understand	BTL 2
11	What are the built-in functions available in Python. Explain.	Create	BTL 6
12	Explain the terminology of raising an exception concept with sample program.	Evaluate	BTL 5
13	Write a program to count the total number of uppercase characters in a file.	Apply	BTL 3
14	Explain the following: (i) Predefined Modules and (ii) User defined Modules	Understand	BTL 2
15	Write a program that validates name and age as entered by the user to determine whether the person can cast vote or not.	Apply	BTL 3
16	Explain with an example to copy the contents of one file to another.	Understand	BTL 2
17	Discuss the different modes for opening a file and closing a file.	Understand	BTL 2
18	Write a program that reads the contents of the file text.txt and counts the number of alphabets, blank spaces, lowercase letters and uppercase letters, the number of words starting with a vowel, and the number of occurrences of each word in the file.	Create	BTL 6

UNIT 5

CLASSES AND OBJECTS

Classes and Objects: Introduction, Classes and Objects, Defining Classes, Creating Objects, Data Abstraction and Hiding, The Class Method and Self Argument, The __init__( ) method, Class Variables and Object Variables, Public and Private data members, Private Methods. Illustrative Programs: Creating Student Class and Objects.

PART A

Sl.No	Questions	Competence	BT Level
1	What is class? How do you define it?	Analyze	BTL 4
2	Differentiate between class variables and instance variables.	Remember	BTL 1
3	Write short notes on special class methods.	Understand	BTL 2
4	Which type of error is caused by trying to access unknown attributes? Explain	Remember	BTL 1
5	Differentiate between public and private variables.	Understand	BTL 2
6	With the help of example explain the concept of classmethods and staticmethods.	Apply	BTL 3
7	Which variable keeps count of number of objects created from a class?	Analyze	BTL 4

8	Examine the difference when class variable is of mutable and immutable type.	Evaluate	BTL 5
9	With the help of an example explain the significance of the __init__() method.	Remember	BTL 1
10	Write short notes on built-in attributes associated with a class.	Evaluate	BTL 5
11	Analyze the significance of __del__() and __repr__() methods.	Remember	BTL 1
12	Which method is automatically executed when an object of a class is created?	Create	BTL 6
13	Examine the term garbage collection.	Remember	BTL 1
14	Write short notes on built-in functions that are used with objects.	Remember	BTL 1
15	Define the term Class instantiation.	Evaluate	BTL 5
16	Explain briefly how class members are accessed.	Analyze	BTL 4
17	How a class is instantiated?	Apply	BTL 3
18	What does the self-argument signify in the class methods?	Understand	BTL 2
19	Which special method returns a string representation of an object?	Analyze	BTL 4
20	Analyze the error that is generated when an attempt to access undefined method is made.	Remember	BTL 1
PART B			
1	Explain the __init__() method with an example.	Apply	BTL 3
2	How class variables and object variables are created? Explain with a sample program.	Understand	BTL 2
3	Illustrate and explain the concept of __del__() method with an example python program.	Apply	BTL 3
4	List and explain with suitable examples the special methods available in python.	Remember	BTL 1
5	Differentiate between public and private data members with example.	Analyze	BTL 4
6	Explain the built-in functions of class attributes with python code.	Understand	BTL 2
7	Write a program to demonstrate the use of built-in class attributes.	Remember	BTL 1
8	Write a program that uses class to store the name and marks of students and display the same.	Understand	BTL 2
9	Write a program to explain the concept of static method.	Remember	BTL 1
10	Explain the concept of class method with an example program.	Understand	BTL 2
11	Write a menu driven program that keeps track of books and journals in a library system.	Analyze	BTL 4
12	Write a program to deposit or withdraw money in a bank account.	Create	BTL 6
13	Write a class that stores a string and all its details such as number of uppercase characters, vowels, consonants, spaces, etc.	Create	BTL 6
14	Write a program that has a class Numbers with values stored in a list. Write a class method to find the largest value.	Analyze	BTL 4
15	Write a python program with class for calculating the area of the rectangle.	Create	BTL 6
16	Write a python program with class for calculating the area and circumference of a circle.	Analyze	BTL 4
17	Write a python program with class Person to find the eligibility to vote.	Create	BTL 6
18	Write a python program with class Employee for storing the employee details.	Create	BTL 6