

**12<sup>th</sup>  
STD**



**COMPUTER SCIENCE**



# **12-COMPUTER SCIENCE SPECIAL GUIDE**

**KRISHNAGIRI DISTRICT**

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**CHIEF**

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**1.Function****Part I - Choose the best answer (1 Mark)**

1. The small sections of code that are used to perform a particular task is called

- (A) Subroutines (B) Files  
(C) Pseudo code (D) Modules

2. Which of the following is a unit of code that is often defined within a greater code structure?

- (A) Subroutines (B) **Function**  
(C) Files (D) Modules

3. Which of the following is a distinct syntactic block?

- (A) Subroutines (B) Function  
(C) **Definition** (D) Modules

4. The variables in a function definition are called as

- (A) Subroutines (B) Function  
(C) Definition (D) **Parameters**

5. The values which are passed to a function definition are called

- (A) **Arguments** (B) Subroutines  
(C) Function (D) Definition

6. Which of the following are mandatory to write the type annotations in the function definition?

- (A) { } (B) ( )  
(C) [ ] (D) < >

7. Which of the following defines what an object can do?

- (A) Operating System (B) Compiler  
(C) **Interface** (D) Interpreter

8. Which of the following carries out the instructions defined in the interface?

- (A) Operating System (B) Compiler  
(C) **Implementation** (D) Interpreter

9. The functions which will give exact result when same arguments are passed are called

- (A) Impure functions (B) Partial Functions  
(C) Dynamic Functions (D) **Pure functions**

10. The functions which cause side effects to the arguments passed are called

- (A) **impure function** (B) Partial Functions  
(C) Dynamic Functions (D) Pure functions

**Part-II -Answer the following questions (2 Marks)**

1. What is a subroutine?

- A small section of code that are used to perform a particular task that can be used repeatedly.

2. Define Function with respect to programming language?

- Set of code that works on many kinds of inputs, like variants, expressions and produces a concrete output.

3. Differentiate interface and implementation?

- Interface- defines what an object can do, but won't actually do it.
- Implementation- carries out the instructions defined in the interface

**Part-III - Answer the following questions (3 Marks)**

1. Mention the characteristics of Interface.
  - The class template specifies the interfaces to enable an object to be created and operated properly.
  - An object's attributes and behaviour is controlled by sending functions to the object.
2. Why Strlen() is called pure function?
  - Strlen() is a pure function because the function takes one variable as a parameter, and accesses it to find its length.
  - It does not cause any side effects.

**2.Data Abstraction****Part I - Choose the best answer (1 Mark)**

- 2.1. Which of the following functions that build the abstract data type ?
 

<b>(A) Constructors</b>	(B) Destructors
(C) recursive	(D)Nested
2. Which of the following functions that retrieve information from the data type?
 

(A) Constructors	<b>(B) Selectors</b>
(C) recursive	(D)Nested
3. The data structure which is a mutable ordered sequence of elements is called
 

(A) Built in	<b>(B) List</b>
(C) Tuple	(D) Derived data
4. A sequence of immutable objects is called
 

(A) Built in	(B) List
<b>(C) Tuple</b>	(D) Derived data
5. The data type whose representation is known are called
 

(A) Built in datatype	(B) Derived datatype
<b>(C) Concrete datatype</b>	(D) Abstract datatype
6. The data type whose representation is unknown are called
 

(A) Built in datatype	(B) Derived datatype
(C) Concrete datatype	<b>(D) Abstract datatype</b>
7. Which of the following is a compound structure?
 

<b>(A) Pair</b>	(B) Triplet
(C) single	(D) quadrat
8. Bundling two values together into one can be considered as
 

<b>(A) Pair</b>	(B) Triplet
(C) single	(D) quadrat
9. Which of the following allow to name the various parts of a multi-item object?
 

(A) Tuples	(B) Lists
<b>(C) Classes</b>	(D) quadrats
10. Which of the following is constructed by placing expressions within square brackets?
 

(A) Tuples	<b>(B) Lists</b>
(C) Classes	(D) quadrats

**Part-II -Answer the following questions (2 Marks)**

1. What is Abstract Data Type?
  - ADT is a type for objects whose behaviour is defined by a set of values and operations.
2. Differentiate Constructors and Selectors?
  - Constructors-Functions that build the abstract data type
  - Selectors-Functions that retrieve information from the data type.
3. What is pair?
 

Bundling two values together into one can be considered as a pair.

Ex: lst:=[10,20]      list=[(0,10),(1,20)]
4. What is List?
  - List is used to implement Pairs.
  - Constructed by placing expressions within square bracket.

**Example: list=[10,20]**
5. What is a Tuple?
 

Comma-separated sequence of values surrounded with parentheses.

**Example: tuple=(10,20)**

**3.Scoping****Part I - Choose the best answer (1 Mark)**

- 3.1. Which of the following refers to the visibility of variables in one part of a program to another part of the same program.
 

(A) Scope	(B) Memory
(C) Address	(D) Accessibility
2. The process of binding a variable name with an object is called
 

(A) Scope	(B) Mapping
(C) late binding	(D) early binding
3. Which of the following is used in programming languages to map the variable and object?
 

(A) ::	(B) :=
(C) =	(D) ==
4. Containers for mapping names of variables to objects is called
 

(A) Scope	(B) Mapping
(C) Binding	(D) Namespaces
5. Which scope refers to variables defined in current function?
 

(A) Local Scope	(B) Global scope
(C) Module scope	(D) Function Scope
6. The process of subdividing a computer program into separate sub-programs is called
 

(A) Procedural Programming	(B) Modular programming
(C) Event Driven Programming	(D) Object oriented Programming
7. Which of the following security technique that regulates who can use resources in a Computing environment?
 

(A) Password	(B) Authentication
(C) Access control	(D) Certification
8. Which of the following members of a class can be handled only from within the class?
 

(A) Public members	(B) Protected members
(C) Secured members	(D) Private members
9. Which members are accessible from outside the class?
 

(A) Public members	(B) Protected members
(C) Secured members	(D) Private members



**Part-II -Answer the following questions (2 Marks)**

1. What is an algorithm?
  - It is a step-by-step procedure for solving a given problem.
2. Define Pseudo code
  - Pseudo code is an informal way of programming description.
3. What is an insertion sort?
  - A simple sorting algorithm that builds the final sorted array or list one item at a time.
4. What is sorting?
  - Process of arranging information or data in an order of sequence either in ascending or descending order.
4. what are the types of sorting techniques?
  - Bubble sort
  - Insertion sort
  - Selection sort
5. what is searching? Write its types ?
 

To search an item in data structure is called searching.

  - Linear search
  - Binary search

**Part-III - Answer the following questions (3 Marks)**

1. List the characteristics of an algorithm.
  - Input
  - Output
  - Finiteness
  - Definiteness
  - Effectiveness
2. What are the factors that influence time and space complexity.
  - Time Factor -Time is measured by counting the number of key operations.
  - Space Factor - Space is measured by the maximum memory space required by the algorithm.
4. Write a note on asymptotic notation.
 

Asymptotic Notations are languages that use meaningful statements about time and space complexity.

  - Big O - worst - case
  - Big  $\Omega$ . – Best case
  - Big  $\theta$  - average case
5. What do you understand by Dynamic programming?
 

Dynamic programming is an algorithmic design method that can be used when the solution to a problem can be viewed as the result of a sequence of decisions.

**Part-IV - Answer the following questions (5Marks)**

1. Discuss about Linear search algorithm.
  - Linear search also called sequential search.
  - It is a sequential method for finding a particular value in a list

**Pseudo code**

1. Traverse the array using for loop
2. In every iteration, compare the target search key value with the current value of the list.



10. Which operator is also called as Conditional operator?

- (A) Ternary (B) Relational  
(C) Logical (D) Assignment

**Part-II - Answer the following questions (2 Marks)**

1. What are the different modes that can be used to test Python Program ? (MAY 2022)

- Interactive mode
- Script mode.

2. Write short notes on Tokens. (Apr 2023)

Python breaks each logical line into a sequence of elementary lexical components.

- Identifiers,
- Keywords,
- Operators,
- Delimiters and
- Literals.

3. What are the different operators that can be used in Python?

- Arithmetic operators
- Relational operators
- Logical operators
- Assignment operators
- conditional operators

4. What is a literal? Explain the types of literals?

Literal is a raw data given to a variable or constant.

Types of literals:

- Numeric
- String
- Boolean

5. What are key words in python?

Keywords are special words that are used by interpreter to recognize the structure of program.

**Example:** break, for, def, while

**Part-III - Answer the following questions (3 Marks)**

1. Write short notes on Arithmetic operator with examples. (may 2022)

An arithmetic operator is a mathematical operator that takes two operands and performs a calculation on them.

**Arithmetic operators:**

`+, -, *, /, %, **, //`

2. Explain Ternary operator with examples. (Apr 2023)

- Ternary operator is also known as conditional operator.
- It evaluates something based on a condition being true or false.

**Example:**

`min = 25 if 25 < 50 else 50 # min = 25`

3. Write short notes on Escape sequences with examples. (Revision test Jan 2022)

An escape sequence is a backslash \ followed by the character you want to insert in python.

**Example:**

- “\t” is a tab,
- “\n” is a new line.

4. What are string literals? Explain.
- String literal is a sequence of characters surrounded by quotes.
  - Python supports single, double and triple quotes for a string.

**Example:**

S =" Hello"

#### Part-IV - Answer the following questions (5Marks)

1. Describe in detail the procedure Script mode programming.

##### Creating scripts in Python :

1. Choose File -> New File
2. An untitled text editor will be displayed
3. type the code in script editor and
4. save the file Ctrl + S
5. choose the (by default saved with the extension of .py).
6. click save button

##### Executing Python script

1. Choose Run -> Run module
2. If any error in the program correct the error and save and press F5.

2. Explain input () and print () functions with examples. (March 2020)

- The input () function helps to enter data at run time by the user

**Example:**

n=input (" Enter your name ")

- The output function print () is used to display the result of the program on the screen after execution.

**Example:**

>>>print( "GHSS")

### 6. Control Structures

#### Part I - Choose the best answer (1 Mark)

1. How many important control structures are there in Python?

- (A) 3 (B) 4  
(C) 5 (D) 6

2. elif can be considered to be abbreviation of

- (A) nested if (B) if..else  
(C) else if (D) if..elif

3. What plays a vital role in Python programming?

- (A) Statements (B) Control  
(C) Structure (D) Indentation

4. Which statement is generally used as a placeholder?

- (A) continue (B) break  
(C) pass (D) goto

5. The condition in the if statement should be in the form of

- (A) Arithmetic or Relational expression (B) Arithmetic or Logical expression  
(C) Relational or Logical expression (D) Arithmetic

6. Which of the following is known as definite loop?

- (A) do..while (B) while  
(C) for (D) if..elif

7. What is the output of the following snippet?

```
i=1
while True:
if i%3 ==0:
break
print(i,end=' ')
i +=1
```

- (A) 12 (B) 123  
(C) 1234 (D) 124

8. What is the output of the following snippet?

```
T=1
while T:
print(True)
break
```

- (A) False (B) True  
(C) 0 (D) 1

9. Which amongst this is not a jump statement ?

- (A) for (B) pass  
(C) continue (D) break

10. Which punctuation should be used in the blank?

```
if <condition>_
statements-block 1
else:
statements-block 2
```

- (A) ; (B) :  
(C) :: (D) !

**Part-II -Answer the following questions (2 Marks)**

1. List the control structures in Python.

- Sequential
- Alternative
- Looping

2. Write note on break statement.

The break statement terminates the loop containing it.

**Syntax:** break

3. Write is the syntax of if..else statement?

```
if <condition>:
statements-block 1
else:
statements-block 2
```

4. Define control structure.

A program statement that causes a jump of control from one part of the program to another is called control structure.

5. Write note on range() in loop.

range() generates a list of values starting from start to step -1.

**Syntax :**

```
range (start,stop,[step]):
```

**Part-III - Answer the following questions (3 Marks)**

1. Explain Jump Statements in Python

The jump statement used to unconditionally transfer the control from one part of the program to another.

**Keywords:** break, continue, pass.

2. Difference between break statement and continue statement

<b>Break</b>	<b>Continue</b>
The break statement terminates the loop containing it.	continue statement is used to skip the remaining part of a loop and start with next iteration.
<pre>for word in "Jump Statement":     if word == "e":         break     print (word, end="")</pre>	<pre>for word in "Jump Statement":     if word == "e":         continue     print (word, end="")</pre>
Output Jump Stat	Output Jump Statmnt

3. Write note on if.. else structure.

The if.. else statement provides control to check the true block as well as the false block.

**Syntax:**

```
if <condition>:
    statements-block 1
else:
    statements-block 2
```

4. Write the syntax of while loop

**Syntax:**

```
while <condition>:
    statements block 1
```

**Part-IV - Answer the following questions (5Marks)**

1. Write a detail note on for loop?

- for loop is an entry check loop.
- The condition is checked in the beginning and the body of the loop is executed if it is only true otherwise the loop is not executed.

➤ **Syntax:**

```
for counter_variable in sequence:
    statement blocks
```

**Example:**

```
for i in range (1,11):
    print (i)
```

**Output:** 1, 2,3,4,5,6,7,8,9,10

2. Write a program to display all 3 digit odd numbers.

```
for i in range (101,1000):
    if i%2 != 0:
        print (i)
```

3. Write a program to display all 3 digit even numbers.

```
for i in range (100,1000,2):
    print (i)
```

**7.Python functions**

**Part I - Choose the best answer (1 Mark)**

7.1.A named blocks of code that are designed to do one specific job is called as

- (A) Loop (B) Branching  
(C) **Function** (D) Block

2. A Function which calls itself is called as  
 (A) Built-in (B) **Recursion**  
 (C) Lambda (D) return
3. Which function is called anonymous un-named function  
 (A) **Lambda** (B) Recursion  
 (C) Function (D) define
4. Which of the following keyword is used to begin the function block?  
 (A) define (B) for  
 (C) finally (D) **def**
5. Which of the following keyword is used to exit a function block?  
 (A) define (B) **return**  
 (C) finally (D) def
6. While defining a function which of the following symbol is used.  
 (A) ; (semicolon) (B) . (dot)  
 (C) : (**colon**) (D) \$ (dollar)
7. In which arguments the correct positional order is passed to a function?  
 (A) **Required** (B) Keyword  
 (C) Default (D) Variable-length
8. Read the following statement and choose the correct statement(s).  
 (I) In Python, you don't have to mention the specific data types while defining function.  
 (II) Python keywords can be used as function name.  
 (A) **I is correct and II is wrong** (B) Both are correct  
 (C) I is wrong and II is correct (D) Both are wrong
9. Pick the correct one to execute the given statement successfully.  
 if \_\_\_\_ : print(x, " is a leap year")  
 (A)  $x\%2=0$  (B)  **$x\%4==0$**   
 (C)  $x/4=0$  (D)  $x\%4=0$
10. Which of the following keyword is used to define the function testpython(): ?  
 (A) define (B) pass  
 (C) **def** (D) while

**Part-II -Answer the following questions (2 Marks)**

1. What is function?

Functions are named blocks of code that are designed to do specific job.

2. Write the different types of function.

- User-defined Functions
- Built-in Functions
- Lambda Functions
- Recursion Functions

3. What are the main advantages of function?

- Code reusing.
- Provides better modularity.

4. What is meant by scope of variable? Mention its types.

Scope of variable refers to the part of the program, where it is accessible.

- Local Scope
- Global Scope

5. Define global scope.

A variable, with global scope can be used anywhere in the program.

**Part-III - Answer the following questions (3 Marks)**

1. Write the rules of local variable.

- A variable with local scope can be accessed only within the function.
- When a variable is created inside the function the variable becomes local.

2. Write the basic rules for global keyword in python.

- We define a variable outside a function, it's global by default.
- We use global keyword to read and write a global variable inside a function.

3. What happens when we modify global variable inside the function?

- Unbound Local Error.

4. Differentiate ceil () and floor () function?

ceil()	floor()
Returns the smallest integer to x	Returns the largest integer to x
math.ceil (x)	math.floor (x)

**Part-IV - Answer the following questions (5Marks)**

1. Explain the different types of function with an example.

- User-defined Functions
- Built-in Functions
- Lambda Functions
- Recursion Functions

2. Explain the scope of variables with an example.

- Local scope.
- Global scope.

3. Explain the following built-in functions.

- id ()-the address of the object in memory.
- chr()- Returns the Unicode character for the given ASCII value.
- round()- Returns the nearest integer to its input.
- type()- Returns the type of object for the given single object.
- pow()- Returns the computation of ab.

**8.Strings and String manipulation**

**Part I - Choose the best answer (1 Mark)**

8.1. Which of the following is the output of the following python code?

```
str1="TamilNadu"
print(str1[::-1])
```

- (A) Tamilnadu
- (B) Tmlau
- (C) udanlimaT
- (D) udaNlimaT

2. What will be the output of the following code?

```
str1 = "Chennai Schools"
```

```
str1[7] = "-"
```

- (A) Chennai-Schools (B) Chenna-School  
(C) **Type error** (D) Chennai

3. Which of the following operator is used for concatenation?

- (A) + (B) &  
(C) \* (D) =

4. Defining strings within triple quotes allows creating:

- (A) Single line Strings (B) **Multiline Strings**  
(C) Double line Strings (D) Multiple Strings

5. Strings in python:

- (A) Changeable (B) Mutable  
(C) **Immutable** (D) flexible

6. Which of the following is the slicing operator?

- (A) {} (B) []  
(C) <> (D) ()

7. What is stride?

- (A) index value of slide operation (B) first argument of slice operation  
(C) second argument of slice operation (D) **third argument of slice operation**

8. Which of the following formatting character is used to print exponential notation in upper case?

- (A) %f (B) **%E**  
(C) %g (D) %n

9. Which of the following is used as placeholders or replacement fields which get replaced along with format() function?

- (A) {} (B) <>  
(C) ++ (D) ^^

10. The subscript of a string may be:

- (A) Positive (B) Negative  
(C) Both (A) and (B) (D) **Either (A) or (b)**

**Part-II -Answer the following questions (2 Marks)**

1. What is String?

String is a data type in python. Strings are immutable, means once you define a string, it cannot be changed during execution.

2. Do you modify a string in Python?

String can't be modified.

3. How will you delete a string in Python?

Remove the entire string variable using **del** command.

4. What will be the output of the following python code?

```
str1 = "School"
```

```
Print (str1*3)
```

**Output:** SchoolSchoolSchool

5. What is slicing?

Slice is a substring of a main string. Where [] operator used.

**Part-III - Answer the following questions (3 Marks)**

1. Write a Python program to display the given pattern

```
COMPUTER
COMPUTE
COMPUT
COMPU
COMP
COM
CO
C
```

**Program:**

```
str1="COMPUTER"
index=8
for i in str1:
    print (str1[:index])
    index-=1
```

2. Write a short about the followings with suitable example:

(a) capitalize ( ) -capitalize the first character of the string.

**Example:** print("python".capitalize())

**Output:** Python

(b) swapcase( )-change case of every character to its opposite case vice-versa.

**Example:**print("pYtHoN".swapcase())

**Output :**PyThOn

3. What will be the output of the given python program?

```
str1 = "welcome"
str2 = "to school"
str3=str1[:2]+str2[len(str2)-2:]
print(str3)           Output:  weol
```

4. What is the use of format( ) ? Give an example.

format( )- function used for formatting strings.

**Example:** x= 14

```
print ('x value in binary :',format(x,'b'))
```

**Output:** x value in binary: 1110

5. Write a note about the count( ) function in python.

Returns the number of substrings that occurs within the given range.

**Example:**

```
str1="Raja Raja Chozhan"
print(str1.count('Raja'))
```

**Output:** 2

**Part-IV - Answer the following questions (5Marks)**

1. Explain about string operators in python with suitable examples.

(i) **Concatenation (+)** -Joining of two or more strings is called Concatenation.

**Example:** `>>> "welcome" + "Python"`

**Output :** welcomePython

(ii) **Append (+ =)** - Adding more strings at the end of an existing string is known as append.

**Example:**

`>>> str1="Welcome to"`

`>>> str1+="Learn Python"`

`>>> print (str1)`

**Output:** Welcome to Learn Python

(iii) **Repeating (\*)** -The multiplication operator (\*) is used to display a string multiple times.

**Example**

`>>> str1="Welcome "`

`>>> print (str1*4)`

**Output:** WelcomeWelcomeWelcomeWelcome.

**9.Lists, Tuples, Sets and Dictionary**

**Part I - Choose the best answer (1 Mark)**

1. Pick odd one in connection with collection data type

- (A) List (B) Tuple  
(C) Dictionary (D) **Loop**

2. Let list1=[2,4,6,8,10], then print(List1[-2]) will result in

- (A) 10 (B) **8**  
(C) 4 (D) 6

3. Which of the following function is used to count the number of elements in a list?

- (A) count() (B) find()  
(C) **len()** (D) index()

4. If List=[10,20,30,40,50] then List[2]=35 will result

- (A) [35,10,20,30,40,50] (B) [10,20,30,40,50,35]  
(C) **[10,20,35,40,50]** (D) [10,35,30,40,50]

5. If List=[17,23,41,10] then List.append(32) will result

- (A) [32,17,23,41,10] (B) **[17,23,41,10,32]**  
(C) [10,17,23,32,41] (D) [41,32,23,17,10]

6.Which of the following Python function can be used to add more than one element within an existing list?

- (A) append() (B) append\_more()  
(C) **extend()** (D) more()

7. What will be the result of the following Python code?

`S=[x**2 for x in range(5)]`

`print(S)`

- (A) [0,1,2,4,5] (B) **[0,1,4,9,16]**  
(C) [0,1,4,9,16,25] (D) [1,4,9,16,25]

8. What is the use of type() function in python?

- (A) To create a Tuple (B) To know the type of an element in tuple.  
(C) **To know the data type of python object** (D) To create a list.

9. Which of the following statement is not correct?

- (A) A list is mutable (B) A tuple is immutable.  
(C) The append() function is used to add an element.

**(D) The extend() function is used in tuple to add elements in a list.**

10. Let setA = {3,6,9}, setB = {1,3,9}. What will be the result of the following snippet?  
`print(setA|setB)`  
 (A) {3,6,9,1,3,9} (B) {3,9}  
 (C) {1} (D) {1,3,6,9}
11. Which of the following set operation includes all the elements that are in two sets but not the one that are common to two sets?  
 (A) **Symmetric difference** (B) Difference  
 (C) Intersection (D) Union
12. The keys in Python, dictionary is specified by  
 (A) = (B) ;  
 (C) + (D) :

**Part-II - Answer the following questions (2 Marks)**

1. What is List in Python?

A list is a sequence data type. The elements of a list should be specified within square brackets.

2. How will you access the list elements in reverse order?

A negative index can be used to access an element in reverse order.

3. What will be the value of x in the following python code?

```
List1=[2,4,6,[1,3,5]]
x=len(List1)
```

**Output: 4**

4. Differentiate del with remove( ) function of List.

Del	remove( )
del statement is used to delete elements whose index is known	remove( ) function is used to delete elements of a list whose index is unknown.

5. Write the syntax of creating a Tuple with n number of elements.

```
Tuples_Name = (E1, E2, E3..... En)
```

6. What is set in Python?

Set is a mutable and an unordered collection of elements without duplicates.

**Part-III - Answer the following questions (3 Marks)**

1. What are the advantages of Tuples over a list?

- The elements of a list are changeable, whereas the elements of a tuple are unchangeable.
- The elements of a list are enclosed within square brackets. But, the elements of a tuple are enclosed by parenthesis.

2. Write a short note about sort( ).

- Sorting the elements in a list.

**Example:**

```
vowels = ['e', 'a', 'u', 'o', 'i']
vowels.sort()
print('Sorted list:', vowels)
```

**Output:** Sorted list: ['a', 'e', 'i', 'o', 'u']

3. What will be the output of the following code?

```
list = [2**x for x in range(5)]
print(list)
```

**Output: [1,2,4,8,16]**

4.Explain the difference between del and clear( ) in a dictionary with an example.

<b>Del</b>	<b>clear( )</b>
del -statement deletes entire list	<b>clear( )</b> is used to delete only the elements
<b>Example:</b> My Subjects=["T", "E", "M", "S", "SS"] >>> del MySubjects >>> print(MySubjects) <b>Output:</b> Error	<b>Example:</b> >>> MyList.clear() >>> print(MyList) <b>Output:</b> [ ]

5. What is the difference between List and Dictionary?

<b>List</b>	<b>Dictionary</b>
List is an ordered set of elements.	Dictionary Used for matching one element with another
index values can be used to access a particular element.	dictionary key represents an index.

**Part-IV - Answer the following questions (5Marks)**

1. What are the different ways to insert an element in a list. Explain with suitable examples.

- **append( )** function is used to add a single element.

**Syntax:**

```
List.append (element to be added)
```

**Example:**

```
>>> MyList=[5, 10, 15]
>>> MyList.append(20)
>>> print(MyList)
```

**Output:**

```
[5, 10, 15, 20]
```

- **extend( )** function is used to add more than one element to an existing list.

**Syntax:**

```
List.extend ( [elements to be added])
```

**Example:**

```
>>> MyList.extend ([25, 30, 35])
>>> print(MyList)
```

**Output:**

```
[5, 10, 15, 20, 25, 30, 35]
```

- **insert( )** function is used to insert an element at any position of a list.

**Syntax:**

```
List.insert (position index, element)
```

2. What is the purpose of range ( )? Explain with an example.

➤ **range( )** is a function used to generate a series of values in Python.

**Syntax:**

```
range (start,stop,step):
```

**Example:**

```
for x in range (1, 11):
    print(x)
```

**Output:** 1 2 3 4 5 6 7 8 9 10

3. What is a nested tuple? Explain with an example.

➤ A tuple can be defined inside another tuple; called a Nested tuple.

**Example:**

```
CSMarks = (("Gowtham", 30, 50), ("Kavya", 30, 66),("Kumar", 30, 65),("Akhil", 30,70))
```

```
for i in CSMarks:
```

```
    print(i)
```

**Output:**

```
("Gowtham", 30, 50)
("Kavya", 30, 66)
("Kumar", 30, 65)
("Akhil", 30,70)
```

4. Explain the different set operations supported by python with suitable examples.

**(i) Union:** It includes all elements from two or more sets

**Operator :** |

**Example:**

```
set_A={10,20,30}
set_B={20,30,40,50}
print(set_A|set_B)
```

**Output:** {10,20,30,40,50}

**(ii) Intersection:** It includes the common elements in two sets

**Operator :** &

**Example:**

```
set_A={10,20,30}
set_B={20,30,40,50}
print(set_A & set_B)
```

**Output:** {20,30}

**(iii) Difference** It includes all elements that are in the first set but not in the second set.

**Operator :** -

**Example:**

```
set_A={10,20,30}
set_B={20,30,40,50}
print(set_A - set_B)
```

**Output:** {10}

(iv) **Symmetric difference** It includes all the elements that are in two sets but not the one that are common to two sets.

**Operator :** ^

**Example:**

set\_A={10,20,30}

set\_B={20,30,40,50}

print(set\_A ^ set\_B)

**Output:** {10,40,50}

### 10. Python Classes and objects

#### Part I - Choose the best answer (1 Mark)

1. Which of the following are the key features of an Object Oriented Programming language?

(A) Constructor and Classes

(B) Constructor and Object

**(C) Classes and Objects**

(D) Constructor and Destructor

2. Functions defined inside a class:

(A) Functions

(B) Module

**(C) Methods**

(D) section

3. Class members are accessed through which operator?

(A) &

**(B) .**

(C) #

(D) %

4. Which of the following method is automatically executed when an object is created?

(A) \_\_object\_\_()

(B) \_\_del\_\_()

(C) \_\_func\_\_()

**(D) \_\_init\_\_()**

5. A private class variable is prefixed with

**(A) \_\_**

(B) &&

(C) ##

(D) \*\*

6. Which of the following method is used as destructor?

(A) \_\_init\_\_()

(B) \_\_dest\_\_()

(C) \_\_rem\_\_()

**(D) \_\_del\_\_()**

7. Which of the following class declaration is correct?

(A) class class\_name

(B) class class\_name<>

**(C) class class\_name:**

(D) class class\_name[ ]

8. Which of the following is the output of the following program?

class Student:

def \_\_init\_\_(self, name):

self.name=name

print (self.name)

S=Student("Tamil")

(A) Error

**(B) Tamil**

(C) name

(D) self

9. Which of the following is the private class variable?

- (A) `__num` (B) `##num`  
 (C) `$$num` (D) `&&num`

10. The process of creating an object is called as:

- (A) Constructor (B) Destructor  
 (C) Initialize (D) **Instantiation**

**Part-II -Answer the following questions (2 Marks)**

1. What is class?

- A class is a way of binding data members and member function together.
- Class is a template for the object.

2. What is instantiation?

- This process of creating object is called as “Class Instantiation”.

3. What is the output of the following program?

```
class Sample:
    __num=10
    def disp(self):
        print(self.__num)

S=Sample()
S.disp()
print(S.__num)
```

**Ans:10**

4. How will you create constructor in Python?

```
def __init__(self, [args .....]):
    <statements>
```

5. What is the purpose of Destructor?

Destructor is a special method gets execution automatically when an object exits from the scope.

**Part-III - Answer the following questions (3 Marks)**

1. What are class members? How do you define it?

- Class variable and methods are together known as members of the class.
- The class members should be accessed through objects or instance of class.

2. Find the error in the following program to get the given output?

```
class Fruits:
    def __init__(self, f1, f2):
        self.f1=f1
        self.f2=f2
    def display(self):
        print("Fruit 1 = %s, Fruit 2 = %s" %(self.f1, self.f2))

F = Fruits ('Apple', 'Mango')
del F.display
F.display()
```

**Output**

Fruit 1 = Apple, Fruit 2 = Mango

**Answer :** Remove the line del F.display.

**3. What is the output of the following program?**

```
class Greeting:
def __init__(self, name):
    self.__name = name
def display(self):
    print("Good Morning ", self.__name)
obj=Greeting('Bindu Madhavan')
obj.display()
```

**Answer.** Good Morning Bindu Madhavan

**4. How do define constructor and destructor in Python?**

<u>Constructor</u>	<u>Destructor</u>
def __init__(self, [args.....]): <statements>	def __del__(self): <statements>

**11.Database Concepts**

**Part I - Choose the best answer (1 Mark)**

- What is the acronym of DBMS?
  - (A) DataBase Management Symbol
  - (B) Database Managing System
  - (C) **DataBase Management System**
  - (D) DataBasic Management System
- A table is known as
  - (A) tuple
  - (B) attribute
  - (C) **relation**
  - (D) entity
- Which database model represents parent-child relationship?
  - (A) Relational
  - (B) Network
  - (C) **Hierarchical**
  - (D) Object
- Relational database model was first proposed by
  - (A) **E F Codd**
  - (B) E E Codd
  - (C) E F Cadd
  - (D) E F Codder
- What type of relationship does hierarchical model represents?
  - (A) one-to-one
  - (B) **one-to-many**
  - (C) many-to-one
  - (D) many-to-many
- Who is called Father of Relational Database from the following?
  - (A) Chris Date
  - (B) Hugh Darween
  - (C) **Edgar Frank Codd**
  - (D) Edgar Frank Cadd
- Which of the following is an RDBMS?
  - (A) Dbase
  - (B) Foxpro
  - (C) **Microsoft Access**
  - (D) Microsoft Excel
- What symbol is used for SELECT statement?
  - (A) **σ**
  - (B) Π
  - (D) Ω
  - (C) X

9. A tuple is also known as  
 (A) table (B) row  
 (C) attribute (D) field
10. Who developed ER model?  
 (A) Chen (B) EF Codd  
 (C) Chend (D) Chand

**Part-II - Answer the following questions (2 Marks)**

1. Mention few examples of a database.  
 (i) Foxpro (ii) DBase (iii) MySQL (iv) Microsoft Excel
2. List some examples of RDBMS.  
 (i) IBM DBZ (ii) Microsoft SQL Server  
 (iii) Microsoft Jet Database Engine (iv) MySQL  
 (v) Oracle (vi) SQLite

**3. What is data consistency?**

Data Consistency means that data values are the same at all instances of a database

**4. What is the difference between Hierarchical and Network data model?**

Hierarchical data model	Network data model
A child record has only one parent node,	A child may have many parent nodes
One-to-many relationship model.	Many-to-many relationship model

**5. What is normalization?**

Normalization reduces data redundancy and improves data integrity

**Part-III - Answer the following questions (3 Marks)**

**1. What is the role of DBA?**

Database Administrator or DBA is the one who manages the complete database management system. DBA takes care of the security of the DBMS, managing the license keys, managing user accounts and access etc.

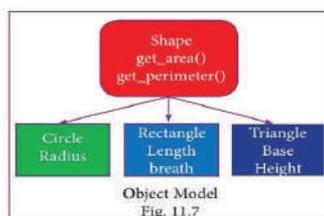
**2. Explain Cartesian Product with a suitable Example:**

- Cross product is a way of combining two relations.
- The resulting relation contains, both relations being combined.

Table A	Table B	Table A X Table B
1	S	1S
2	R	1R
3		2S
		2R
		3S
		3R

**3. Explain Object Model with example.**

Object model stores the data in the form of objects, attributes and methods, Classes and inheritance.



**4. Write a note on different types of DBMS users.**

- (i) Database Administrators      (ii) Application Programmers or Software Developers
- (iii) End User                              (iv) Database designers

**Part-IV - Answer the following questions (5Marks)**

**1. Explain the different types of data model.**

**1. Hierarchical Model**

- 1. Hierarchical model was developed by IBM
- 2. This model represents a one-to-many relationship
- 3. One parent can have many children

**2. Relational Model**

- 1. This model proposed by E.F. Codd in 1970
- 2. The basic structure of data in relational model is tables (relations)

**3. Network Model**

- 1. It represents a child may have many parent nodes.
- 2. It represents the data in manyto-many relationships

**4. Entity Relationship Model. (ER model)**

- 1. It was developed by Chen in 1976.
- 2. Rectangle- entities, Ellipse- attributes, Diamond represents the relationship

**5. Object Model**

- 1. Object model stores the data in the form of objects, attributes & methods, classes & Inheritance.

**2. Explain the different types of relationship mapping.**

- (i) One-to-One Relationship
- (ii) One-to-Many Relationship
- (iii) Many-to-One Relationship
- (iv) Many-to-Many Relationship

**3. Differentiate DBMS and RDBMS.**

Basics of Comparison	DBMS	RDBMS
<b>1. Expansion</b>	Database Management System	Relational Database Management System
<b>2. Data Redundancy</b>	Exhibit	Not Present
<b>3. Normalization</b>	Not Performed	RDBMS uses normalization to reduce redundancy
<b>4. Data Access</b>	Consumes more time	Faster, Compared to DBMS
<b>5. Distributed Database</b>	Not Supported	Supported
<b>6. Example</b>	Dbase, FoxPro	SQL server, oracle, mysql, maria DB, SQLite

**4. Explain the different operators in Relational algebra with suitable examples.**

**1. UNION (Symbol:  $\cup$ )**

- It includes all tuples that are in tables A or in B. It also eliminates duplicates.
- Set A Union Set B would be expressed as  $A \cup B$

**2. INTERSECTION (symbol:  $\cap$ )**

- Defines a relation consisting of a set of all tuple that are in both in A and B. However, A and B must be union-compatible.
- Set A Intersection Set B would be expressed as  $A \cap B$

**3. DIFFERENCE (Symbol:  $-$ )**

- It is a relation which includes all tuples that are in A but not in B.
- Set A Difference Set B would be expressed as  $A - B$

**4. CARTESIAN PRODUCT (Symbol: X)**

- Cross product is a way of combining two relations. The resulting relation contains, both relations being combined.
- It represents A X B

**5. Explain the characteristics of DBMS.**

**1. Data stored into Tables**

Data is never directly stored into the database. Data is stored into tables, created inside the database.

**2. Reduced Redundancy**

DBMS follows Normalization which divides the data in such a way that repetition is minimum.

**3. Query Language**

DBMS provides users with a simple query language, using which data can be easily fetched, inserted, deleted and updated in a database

**4. Security**

DBMS also takes care of the security of data, protecting the data from unauthorized access.

**5. DBMS Supports Transactions**

It allows us to better handle and manage data integrity in real world applications where multi-threading is extensively used.

**12. Structured Query Language (SQL)**

**Part I - Choose the best answer (1 Mark)**

1. Which commands provide definitions for creating table structure, deleting relations, and modifying relation schemas.

- a. DDL
- b. DQL
- c. DCL
- d. DQL

2. Which command lets to change the structure of the table?

- a. SELECT
- b. ORDER BY
- c. MODIFY
- d. ALTER

3. The command to delete a table including the structure is

- a. DROP
- b. DELETE
- c. DELETE ALL
- d. ALTER TABLE

4. Queries can be generated using

- a. SELECT
- b. ORDER BY
- c. MODIFY
- d. ALTER

5. The clause used to sort data in a database

- a. SORT BY
- b. ORDER BY
- c. GROUP BY
- d. SELECT

**Part-II - Answer the following questions (2 Marks)**

1. Write a query that selects all students whose age is less than 18 in order wise.

SELECT \* FROM student WHERE Age < 18;

2. Write the difference between table constraint and column constraint?

Column constraint	Table constraint
Column constraint can be applied only to individual column	Table constraint is applied to a group of fields of the table.

3. Which component of SQL lets insert values in tables and which lets to create a table?

Component of SQL:

- (i) Insert values of tables- DDL - Data Definition Language
- (ii) Create a table-DML - Data Manipulation Language

4. What is the difference between SQL and MySQL?

SQL	MySQL
SQL is a database language to manage data in a relational database.	MySQL is an open source Relational Database Management System that helps to manage relational databases.

Part-III - Answer the following questions (3 Marks)

1. What is a constraint? Write short note on Primary key constraint.

Constraints are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database.

**Primary Constraint:**

- (i) This constraint declares a field as a Primary key which helps to uniquely identify a record.
- (ii) The primary key does not allow NULL values

2. Write a SQL statement to modify the student table structure by adding a new field.

ALTER TABLE <table-name> ADD <column- name><data type><size>;

3. Write any three DDL commands.

- (i)DELETE (ii)TRUNCATE (iii)DROP

4. Write the use of Savepoint command with an example.

The SAVEPOINT command is used to temporarily save a transaction so that you can rollback to the point whenever required.

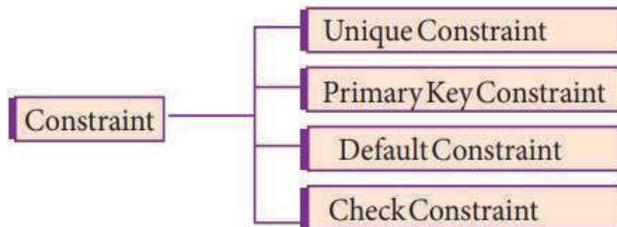
5. Write a SQL statement using DISTINCT keyword

(i) The DISTINCT keyword is used along with the SELECT command to eliminate duplicate rows in the table. This helps to eliminate redundant data.

**Example:** SELECT DISTINCT Place FROM Student;

Part-IV - Answer the following questions (5Marks)

1. Write the different types of constraints and their functions.



2. What are the components of SQL? Write the commands in each.

- **DDL - Data Definition Language Commands:** CREATE, ALTER, DROP & TRUNCATE
- **DML - Data Manipulation Language Commands:** INSERT, UPDATE & DELETE
- **DCL - Data Control Language Commands:** GRANT & REVOKE
- **TCL - Transaction Control Language Commands:** COMMIT, ROLLBACK & SAVEPOINT
- **DQL - Data Query Language Commands:** SELECT

3. Construct the following SQL statements in the student table-

- (i) SELECT statement using GROUP BY clause.
- (ii) SELECT statement using ORDER BY clause.

(i) **GROUP BY clause:**

GROUP BY clause is used with the SELECT statement to group the students on rows or columns having identical values or divide the table in to groups.

**Syntax:**

■ SELECT <column-names> FROM <table- name> GROUP BY <column-name>HAVING condition];

**(ii) ORDER BY clause:**

ORDER BY clause in SQL is used to sort the data in either ascending or descending based on one or more columns.

**Syntax:**

■ SELECT <column-name>[,<column-name>,....] FROM <table-name>ORDER BY <column1>,<column2>,...ASC| DESC;

4. Consider the following employee table. Write SQL commands for the qtns.(i) to (v).

EMP CODE	NAME	DESIG	PAY	ALLOWANCES
S1001	Hariharan	Supervisor	29000	12000
P1002	Shaji	Operator	10000	5500
P1003	Prasad	Operator	12000	6500
C1004	Manjima	Clerk	8000	4500
M1005	Rathessh	Mechanic	20000	7000

i. To display the details of all employees in descending order of pay.

SELECT \* FROM employee order by PAY DESC;

ii. To display all employees whose allowance is between 5000 and 7000.

SELECT \* FROM employee WHERE ALLOWANCES BETWEEN 5000 AND 7000

iii. To remove the employees who are mechanic.

DELETE From employee WHERE DESIG="Mechanic";

iv. To add a new row.

ALTER TABLE employee ADD Age Varchar (50);

v. To display the details of all employees who are operators.

SELECT \* FROM employee WHERE DESIG ="Operator"

**13.Python and CSV files**

**Part I - Choose the best answer (1 Mark)**

1. A CSV file is also known as a ....

- (A) Flat File
- (B) 3D File
- (C) String File
- (D) Random File

2.The expansion of CRLF is

- (A) Control Return and Line Feed
- (B) Carriage Return and Form Feed
- (C) Control Router and Line Feed
- (D) Carriage Return and Line Feed

3.Which of the following module is provided by Python to do several operations on the CSV files?

- (A) py
- (B) xls
- (C) csv
- (D) os

4. Which of the following mode is used when dealing with non-text files like image or exe files?

- (A) Text mode
- (B) Binary mode
- (C) xls mode
- (D) csv mode

5.The command used to skip a row in a CSV file is

- (A) next()
- (B) skip()
- (C) omit()
- (D) bounce()

6.Which of the following is a string used to terminate lines produced by writer()method of csv module?

- (A) Line Terminator
- (B) Enter key
- (C) Form feed
- (D) Data Terminator

7. What is the output of the following program?

```
import csv
d=csv.reader(open('c:\PYPRG\ch13\city.csv'))
next(d)
for row in d:
print(row)
if the file called "city.csv" contain the following details
chennai,mylapore
mumbai,andheri
```

- (A) chennai,mylapore (B) **mumbai,andheri**  
 (C) chennai mumbai,andheri (D) chennai,mylapore mumba

8. Which of the following creates an object which maps data to a dictionary?

- (A) listreader() (B) reader()  
 (C) tuplereader() (D) **DictReader ()**

9. Making some changes in the data of the existing file or adding more data is called

- (A) Editing (B) Appending  
 (C) **Modification** (D) Alteration

10. What will be written inside the file test.csv using the following program

```
import csv
D = [['Exam'], ['Quarterly'], ['Halfyearly']]
csv.register_dialect('M', lineterminator = '\n')
with open('c:\pyprg\ch13\line2.csv', 'w') as f:
wr = csv.writer(f, dialect='M')
wr.writerows(D)
f.close()
```

- (A) Exam Quarterly Halfyearly (B) Exam Quarterly Halfyearly  
 (C) EQH (D) **Exam,Quarterly,Halfyearly**

**Part-II -Answer the following questions (2 Marks)**

1. What is CSV File?

A CSV file is a human readable text file where each line has a number of fields, separated by commas or some other delimiter.

2. Mention the two ways to read a CSV file using Python.

- csv.reader()
- DictReader()

3. Mention the default modes of the File.

- Reading (r)
- Text (t)

4. What is use of next() function?

“next()” command is used to avoid or skip the first row or row heading.

5. How will you sort more than one column from a csv file? Give an example statement.

To sort by more than one column you can use item getter with multiple indices.

**Syntax:** operator.itemgetter(col\_no)

**Example:** sortedlist = sorted (data, key=operator.itemgetter(1))

**Part-III - Answer the following questions (3 Marks)**

1. Write a note on open() function of python. What is the difference between the two methods?

- Python has a built-in function open() to open a file.
- This function returns a file object, also called a handle, as it is used to read or modify the file accordingly.

**2. Write a Python program to modify an existing file.**

- In this program, the third row of “student.csv” is modified and saved.
- First the “student.csv” file is read by using csv.reader() function.
- Then, the list() stores each row of the file.
- The statement “lines[3]= row”, changed the third row of the file with the new content in “row”.
- The file object writer using write rows (lines) writes the values of the list to “student.csv” file.

**3. Write a Python program to read a CSV file with default delimiter comma (,).**

```
#importing csv
import csv
with open('c:\\pyprg\\sample1.csv', 'r') as F:
    reader = csv.reader(F)
    print(row)
F.close()
```

OUTPUT: ['SNO', 'NAME', 'CITY']  
 ['12101', 'RAM', 'CHENNAI']  
 ['12102', 'LAVANYA', 'TIRUCHY']  
 ['12103', 'LAKSHMAN', 'MADURAI']

**4. What is the difference between the write mode and append mode.**

Write Mode	Append Mode
'w'	'a'
Open a file for writing.	Open for appending at the end of the file without truncating it
Creates a new file if it does not exist or truncates the file if it exists.	Creates a new file if it does not exist

**5. What is the difference between reader() and DictReader() function?**

Reader()	DictReader()
csv. Reader work with list/tuple.	csv.DictReader work with dictionary.

**Part-IV - Answer the following questions (5Marks)**

**1. Differentiate Excel file and CSV file.**

Excel	CSV
Excel is a binary file that holds information about all the worksheets in a file, including both content and formatting.	CSV format is a plain text format with a series of values separated by commas
XLS files can only be read by applications that have been especially written to read their format, and can only be written in the same way	CSV can be opened with any text editor in Windows like notepad, MS Excel, OpenOffice, etc.
Excel is a spreadsheet that saves files into its own proprietary format viz. xls orxlsx	CSV is a format for saving tabular information into a delimited text file with extension .csv
Excel consumes more memory while importing data	Importing CSV files can be much faster, and it also consumes less memory

**2. Tabulate the different mode with its meaning.**

**Python File Modes:**

Mode	Description
'r'	Open a file for reading. (default)
'w'	Open a file for writing. Creates a new file if it does not exist or truncates the file if it exists.
'x'	Open a file for exclusive creation. If the file already exists, the operation fails.
'a'	Open for appending at the end of the file without truncating it. Creates a new file if it does not exist.
't'	Open in text mode. (default)
'b'	Open in binary mod
'+'	Open a file for updating (reading and writing

**3. Write the rules to be followed to format the data in a CSV file.**

- Each record (row of data) is to be located on a separate line by pressing enter key.
- The last record in the file may or may not have an ending line break.
- The last field in the record must not be followed by a comma.
- Fields containing line breaks, double quotes and comma should be enclosed in double quotes.
- If double-quotes are used to enclose fields then a double-quote appearing inside a field must be preceded with another double quote.

**14.Importing C++ programs in Python.**

**Part I - Choose the best answer (1 Mark)**

- Which of the following is not a scripting language?  
 (A) JavaScript (B) PHP  
 (C) Perl (D) **HTML**
- Importing C++ program in a Python program is called  
 (A) **wrapping** (B) Downloading  
 (C) Interconnecting (D) Parsing
- The expansion of API is  
 (A) Application Programming Interpreter (B) **Application Programming Interface**  
 (C) Application Performing Interface (D) Application Programming Interlink
- A framework for interfacing Python and C++ is  
 (A) Ctypes (B) SWIG  
 (C) Cython (D) **Boost**
- Which of the following is a software design technique to split your code into separate parts?  
 (A) Object oriented Programming (B) **Modular programming**  
 (C) Low Level Programming (D) Procedure oriented Programming
- The module which allows you to interface with the Windows operating system is  
 (A) **OS module** (B) sys module  
 (C) csv module (D) getopt module
- getopt() will return an empty array if there is no error in splitting strings to  
 (A) argv variable (B) opt variable  
 (C) **args variable** (D) ifile variable
- Identify the function call statement in the following snippet.  

```
if __name__ == '__main__':
    main(sys.argv[1:])
```

 (A) **main(sys.argv[1:])** (B) \_\_name\_\_  
 (C) \_\_main\_\_ (D) argv
- Which of the following can be used for processing text, numbers, images, and scientific data?  
 (A) HTML (B) C  
 (C) C++ (D) **PYTHON**
- What does \_\_name\_\_ contains ?  
 (A) c++ filename (B) main() name  
 (C) **python filename** (D) os module name

**Part-II -Answer the following questions (2 Marks)**

**1. What is the theoretical difference between Scripting language and other programming language?**

Scripting Language	Programming Language
A scripting language requires an interpreter.	A programming language requires a compiler.
A scripting language need not be compiled	A programming languages needs to be compiled before running .
Example: JavaScript, VBScript, PHP, Perl, Python, Ruby, ASP and Tcl	Example: C, C++, Java, C# etc.

**2. Differentiate compiler and interpreter.**

Compiler	Interpreter
Compiler generates an Intermediate Code.	Interpreter generates Machine Code.
Compiler reads entire program for compilation	Interpreter reads single statement at a time for interpretation.
Error deduction is difficult	Error deduction is easy
Comparatively faster	Slower
Example: gcc, g++, Borland TurboC	Example: Python, Basic, Java

**3. Write the expansion of (i) SWIG (ii) MinGW**

**SWIG** - Simplified Wrapper Interface Generator - Both C and C++

**MinGW** - Minimalist GNU for Windows

**4. What is the use of modules?**

- Modules are used to break down large programs into small manageable and organized files.
- Modules provide reusability of code.
- We can define our most used functions in a module and import it, instead of copying their definitions into different programs.

**5. What is the use of cd command. Give an example.**

“cd” command used to change directory and absolute path refers to the complete path where Python is installed.

**Example:** c:\>cd c:\ program files \ openoffice 4 \ program

**Part-III - Answer the following questions (3 Marks)**

**1. Differentiate PYTHON and C++.**

PYTHON	C++
Python is typically an "interpreted" language	C++ is typically a "compiled" language
Python is a dynamic-typed language	C++ is compiled statically typed language
Data type is not required while declaring variable	Data type is required while declaring variable
It can act both as scripting and general purpose language	It is a general purpose language

**2. What are the applications of scripting language?**

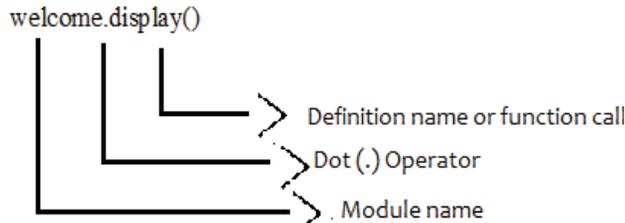
- To automate certain tasks in a program
- Extracting information from a data set
- Less code intensive as compared to traditional programming language
- can bring new functions to applications and glue complex systems together

**3. What is MinGW? What is its use?**

- MinGW refers to a set of runtime header files.
- It is used in compiling and linking the code of C, C++ and FORTRAN to be run on Windows Operating System.
- MinGW allows to compile and execute C++ program dynamically through Python program using: g++.

4. Identify the module ,operator, definition name for the following: `welcome.display()`

1. `welcome.display()`



5. What is `sys.argv`? What does it contain?

`sys.argv` is the list of command-line arguments passed to the Python program.

- `argv` contains all the items that come along via the command-line input, it's basically an array holding the command-line arguments of the program.
- To use `sys.argv`, you will first have to import `sys`.
- `sys.argv[0]` is always the name of the program as it was invoked.
- `sys.argv[1]` is the first argument you pass to the program.

Part-IV - Answer the following questions (5Marks)

1. Write any 5 features of Python.

- Python uses Automatic Garbage Collection.
- Python is a dynamically typed language.
- Python runs through an interpreter.
- Python code tends to be 5 to 10 times shorter than that written in C++.
- In Python, there is no need to declare types explicitly.
- In Python, a function may accept an argument of any type, and return multiple values without any kind of declaration beforehand.

2. Explain each word of the following command.

COMMAND: `Python<filename.py> -<i> <C++ filename without cpp extension>`

Python	Keyword to execute the Python program from command-line
<filename.py>	Name of the Python program to executed
-<i>	Input mode
<C++ filename without cpp extension>	Name of C++ file to be compiled and executed

15.Data manipulation through SQL

Part I - Choose the best answer (1 Mark)

- Which of the following is an organized collection of data?
  - (A) Database
  - (B) DBMS
  - (C) Information
  - (D) Records
- SQLite falls under which database system?
  - (A) Flat file database system
  - (B) Relational Database system
  - (C) Hierarchical database system
  - (D) Object oriented Database system
- Which of the following is a control structure used to traverse and fetch the records of the database?
  - (A) Pointer
  - (B) Key
  - (C) Cursor
  - (D) Insertion point
- Any changes made in the values of the record should be saved by the command
  - (A) Save
  - (B) Save As
  - (C) Commit
  - (D) Oblige

5. Which of the following executes the SQL command to perform some action?  
 (A) **execute()** (B) key()  
 (C) cursor() (D) run()
6. Which of the following function retrieves the average of a selected column of rows in a table?  
 (A) Add() (B) SUM()  
 (C) **AVG()** (D) AVERAGE()
7. The function that returns the largest value of the selected column is  
 (A) **MAX()** (B) LARGE()  
 (C) HIGH() (D) MAXIMUM()
8. Which of the following is called the master table?  
 (A) **sqlite\_master** (B) sql\_master  
 (C) main\_master (D) master\_main
9. The most commonly used statement in SQL is  
 (A) cursor (B) **select**  
 (C) execute (D) commit
10. Which of the following keyword avoid the duplicate?  
 (A) **Distinct** (B) Remove  
 (C) Where (D) GroupBy

**Part-II - Answer the following questions (2 Marks)**

1. Which method is used to connect a database? Give an example.

- connect () method

Ex: connection = sqlite3.connect ("Academy.db")

2. Which method is used to fetch all rows from the database table?

cursor.fetchall() -fetchall () method is to fetch all rows from the database table

**Part-III - Answer the following questions (3 Marks)**

1. What is SQLite?What is it advantage?

SQLite is a simple relational database system, which saves its data in regular data files. SQLite is fast, rigorously tested, and flexible, making it easier to work.

2. Mention the difference between fetchone() and fetchmany().

	fetchone()	fetchmany()
1	Returns the next row of the query results.	Returns the next number of n rows in the result sets.
2	Does not need any argument.	No of rows(n) to be sent as argument.
3	E.g.: r=cursor.fetchone()	E.g.: r=cursor.fetchmany(3)

**Part-IV - Answer the following questions (5Marks)**

1. Write in brief about SQLite and the steps used to use it.

SQLite is a simple relational database system, which saves its data in regular data files. SQLite is fast, rigorously tested, and flexible, making it easier to work.

Step 1: import sqlite3

Step 2:create a connection using connect () method and pass the name of the database File

Step 3 :Set the cursor object cursor = connection. cursor ()

**16.Data visualization using pyplot: line chart, pie chart and bar chart**

**Part I - Choose the best answer (1 Mark)**

1. Which is a python package used for 2D charts?

- (A) **matplotlib.pyplot** (B)matplotlib.pip  
 (C)matplotlib.numpy d (D)matplotlib.plt

2. Identify the package manager for installing Python packages, or modules.
 

(A) Matplotlib	<b>(B)PIP</b>
(C)plt.show()	(D)python package
3. Which of the following feature is used to represent data and information graphically?
 

(A) Data List	(B)Data Tuple
(C)Classes and Objects	<b>(D)Data Visualization</b>
4. .... is a collection of resources assembled to create a single unified visual display.
 

(A) Interface	<b>(B)Dashboard</b>
(C)Objects	(D)Graphics
5. Which of the following module should be imported to visualize data and information in Python?
 

(A) csv	(B)getopt
(C)mysql	<b>(D)matplotlib</b>
- 6..... is a type of chart which displays information as a series of data points connected by straight line segments.
 

<b>(A) Line Chart</b>	(B)Pie chart
(C)Bar chart	(D)All the above
7. Identify the right type of chart using the following hints.
 

Hint 1: This chart is often used to visualize a trend in data over intervals of time.

Hint 2: The line in this type of chart is often drawn chronologically.

<b>(A) Line chart</b>	(B)Bar chart
(C)Pie chart	(D)Scatter plot
8. Read the statements given below. Identify the right option from the following for pie chart.
 

Statement A: To make a pie chart with Matplotlib, we can use the plt.pie() function.

Statement B: The autopct parameter allows us to display the percentage value using the Python string formatting.

(A) Statement A is correct	(B)Statement B is correct
<b>(C)Both the statements are correct</b>	(D)Both the statements are wrong

**Part-II -Answer the following questions (2 Marks)**

**1. Define: Data Visualization.**

Data Visualization is the graphical representation of information and data.

**2. List the general types of data visualization.**

- Charts
- Tables
- Graphs
- Maps
- Infographics
- Dashboards.

**3. List the types of Visualizations in Matplotlib.**

- Line plot
- Scatter plot
- Histogram
- Box plot
- Bar chart
- Pie chart

**4. How will you install Matplotlib?**

Install matplotlib using pip. Pip is management software for installing python packages.

**Part-III - Answer the following questions (3 Marks)****1. Write any three uses of data visualization.**

1. Analyze and interpret the data easily.
2. It makes complex data understandable and usable.
3. Various Charts to show relationship in the data for one or more variables.

**2. Write the coding for the following:**

- a. To Install PIP in your PC. **Python –m pip install –U pip**
- b. To Check the version of PIP installed in your PC. **Pip--version**
- c. To list the packages in your system. **Pip list**

**Part-IV - Answer the following questions (5Marks)****1. Explain the various buttons in a matplotlib window.**

- **Home Button** → If you ever want to return back to the original view, you can click on this.
- **Forward/Back buttons** → You can click these to move back to the previous point you were at, or forward again.
- **Pan Axis** → This cross-looking button allows you to click it, and then click and drag your graph around.
- **Zoom** → The Zoom button lets you click on it, then click and drag a square that you would like to zoom into specifically.
- **Configure Subplots** → This button allows you to configure various spacing options with your figure and plot.
- **Save Figure** → This button will allow you to save your figure in various forms.

**2. Explain the purpose of the following functions:**

- a. `plt.xlabel`-specifies label for X-axis
- b. `plt.ylabel` -specifies label for Y-axis
- c. `plt.title` -specifies title to the graph
- d. `plt.legend()` -invoke the default legend
- e. `plt.show()`- To display graph.

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LINK	<a href="https://www.geogebra.org/m/s7b6snxf">https://www.geogebra.org/m/s7b6snxf</a>	<a href="https://www.geogebra.org/m/psbpm2hq">https://www.geogebra.org/m/psbpm2hq</a>
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