### ****Declaring Variables, Data Types in Programs****

1. **What is the correct way to declare a variable in Python?**  
   a) int x = 10  
   b) x = 10  
   c) var x: int = 10  
   d) declare x = 10  
   **Answer:** b) x = 10

### ****Your First Python Program****

1. **What function is used to display output in Python?**  
   a) echo()  
   b) print()  
   c) display()  
   d) write()  
   **Answer:** b) print()

### ****Flow of Control (If, If-else, Nested If-else)****

**What will be the output of the given code:x = 5**

**if x > 3:**

**print("Yes")**

**else:**

**print("No")**

a) Yes  
b) No  
c) Error  
d) None  
**Answer:** a) Yes

### ****Looping (For, While, Nested Loops)****

1. **Which loop is used when the number of iterations is known beforehand?**  
   a) While loop  
   b) For loop  
   c) Infinite loop  
   d) Conditional loop  
   **Answer:** b) For loop

### ****Strings and Tuples****

**What does the following code output?**

**my\_str = "Hello World"**

**print(my\_str[0:5])**

a) Hello World  
b) Hello  
c) World  
d) Error  
**Answer:** b) Hello

### ****Dictionaries****

1. **Which of the following is the correct way to define a dictionary?**  
   a) {1: "one", 2: "two"}  
   b) ["one", "two"]  
   c) (1: "one", 2: "two")  
   d) 1: "one", 2: "two"  
   **Answer:** a) {1: "one", 2: "two"}

### ****Working with Lists****

1. **How do you append an element to a list?**  
   a) list.add(element)  
   b) list.append(element)  
   c) list.insert(element)  
   d) list.put(element)  
   **Answer:** b) list.append(element)

### ****Defining and Calling Functions****

1. **What keyword is used to define a function in Python?**  
   a) function  
   b) define  
   c) def  
   d) func  
   **Answer:** c) def

### ****Anonymous Functions (Lambda, Map, List Comprehension)****

**What does the following lambda function do?**

**square = lambda x: x \*\* 2**

**print(square(4))**

a) Outputs 2  
b) Outputs 8  
c) Outputs 16  
d) Outputs 4  
**Answer:** c) Outputs 16

### ****Using Built-In Functions****

1. **What does the** type() **function do?**  
   a) Returns the type of a variable  
   b) Converts a value to a string  
   c) Prints a variable's value  
   d) Finds the length of a variable  
   **Answer:** a) Returns the type of a variable

**Intermediate Level:**

**What is the output of the following code?**

**x = "5"**

**y = int(x) + 5**

**print(type(y))**

a) <class 'int'>  
b) <class 'str'>  
c) <class 'float'>  
d) Error  
**Answer:** a) <class 'int'>

### ****Flow of Control (If, If-else, Nested If-else)****

1. **What will be the output of the following code:**

x = 10

if x > 5:

if x < 15:

print("A")

else:

print("B")

else:

print("C")

a) A  
b) B  
c) C  
d) Error  
**Answer:** a) A

### ****Looping (For, While, Nested Loops)****

1. **What is the output of the following code:**

for i in range(3):

for j in range(2):

print(i, j)

a) 0 0, 1 0, 2 0  
b) 0 0, 0 1, 1 0, 1 1, 2 0, 2 1  
c) 0 1, 1 2, 2 3  
d) Error  
**Answer:** b) 0 0, 0 1, 1 0, 1 1, 2 0, 2 1

### ****Strings****

1. **What does the following code output**

s = "PythonProgramming"

print(s[::-1])

a) PythonProgramming  
b) gnimmargorPnothPy  
c) Python  
d) Error  
**Answer:** b) gnimmargorPnothPy

### ****Dictionaries****

1. **What is the output of the following code**

d = {'a': 1, 'b': 2, 'c': 3}

d['d'] = 4

print(len(d))

1. 3  
   b) 4  
   c) 5  
   d) Error  
   **Answer:** b) 4

### ****Working with Lists****

1. **What will be the result of the following code**

lst = [1, 2, 3, 4]

lst.pop(2)

print(lst)

1. [1, 2, 3]  
   b) [1, 2, 4]  
   c) [1, 3, 4]  
   d) Error  
   **Answer:** b) [1, 2, 4]

### ****Defining and Calling Functions****

1. **What is the output of the following function call?**

def add(x, y=5):

return x + y

print(add(10))

a) 10  
b) 15  
c) 20  
d) Error  
**Answer:** b) 15

### ****Anonymous Functions (Lambda, Map, List Comprehension)****

1. **What does the following code output**

nums = [1, 2, 3, 4]

squares = list(map(lambda x: x \*\* 2, nums))

print(squares)

1. [1, 2, 3, 4]  
   b) [1, 4, 9, 16]  
   c) [2, 3, 4, 5]  
   d) Error  
   **Answer:** b) [1, 4, 9, 16]

### ****Global and Local Variables****

1. **What will happen when the following code is executed?**

x = 10

def func():

global x

x += 5

func()

print(x)

1. 10  
   b) 15  
   c) Error  
   d) Undefined behavior  
   **Answer:** b) 15

### ****Concepts of Modules****

1. **What does the** pickle **module in Python do?**  
   a) Converts text to binary  
   b) Serializes and deserializes Python objects  
   c) Encrypts and decrypts data  
   d) Compresses and decompresses data  
   **Answer:** b) Serializes and deserializes Python objects

### ****The R Project for Statistical Computing****

1. **What is the main purpose of the R programming language?**  
   a) Web development  
   b) Statistical computing and data analysis  
   c) Mobile app development  
   d) Network security  
   **Answer:** b) Statistical computing and data analysis

### ****Introduction & Installation of R****

1. **Which of the following is required to install R on your system?**  
   a) An IDE like PyCharm  
   b) The Comprehensive R Archive Network (CRAN)  
   c) A cloud-based environment  
   d) A subscription to RStudio  
   **Answer:** b) The Comprehensive R Archive Network (CRAN)

### ****Exploring RStudio****

1. **Which panel in RStudio is primarily used for writing scripts and functions?**  
   a) Console panel  
   b) Source panel  
   c) Environment panel  
   d) Viewer panel  
   **Answer:** b) Source panel

Ques: Output?

x <- 10

y <- 5

result <- x %% y

print(result)

a) 0  
b) 2  
c) 5  
d) Error  
**Answer:** a) 0

### ****Data Objects - Data Types & Data Structures****

1. **Which of the following is NOT a valid data structure in R?**  
   a) Vector  
   b) Matrix  
   c) Data Frame  
   d) HashMap  
   **Answer:** d) HashMap

### ****Functions****

1. **What is the correct syntax to create a custom function in R?**  
   a) function name() { ... }  
   b) def name(): ...  
   c) name <- function() { ... }  
   d) func name() { ... }  
   **Answer:** c) name <- function() { ... }

### ****Built-in Functions in R****

1. **What will the following R code output**

x <- c(1, 2, 3, 4)

mean(x)

### 2.5 b) 10 c) 4 d) Error ****Answer:**** a) 2.5

### ****Packages in R****

1. **Which function is used to install a package in R?**  
   a) install()  
   b) install.package()  
   c) install.packages()  
   d) load.package()  
   **Answer:** c) install.packages()

### ****Reading & Importing Data****

1. **Which of the following is the correct function to read a CSV file into R?**  
   a) read\_csv()  
   b) read.csv()  
   c) import.csv()  
   d) load.csv()  
   **Answer:** b) read.csv()

### ****Exporting Data from R****

1. **What function is used to write data to a text file in R?**  
   a) write()  
   b) write.file()  
   c) write.table()  
   d) save.table()  
   **Answer:** c) write.table()

### ****Handling Data in R Workspace****

1. **Which function is used to view all the objects currently available in the R workspace?**  
   a) list.objects()  
   b) ls()  
   c) workspace()  
   d) objects()  
   **Answer:** b) ls()

### ****Working with Packages****

1. **What is the correct function to load a package in R after it has been installed?**  
   a) library()  
   b) load.package()  
   c) install()  
   d) require.library()  
   **Answer:** a) library()

### ****Object-Oriented Python****

1. **What will be the output of the following code:**

class Test:

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

self.\_\_x = 5

def display(self):

return self.\_\_x

obj = Test()

print(obj.\_\_x)

a) 5  
b) Error: AttributeError  
c) None  
d) 0  
**Answer:** b) Error: AttributeError

### ****Inheritance, Overloading, and Overriding****

1. **Which of the following correctly describes method overriding in Python?**  
   a) Defining methods with the same name but different parameters in a single class  
   b) Redefining a method in a subclass that is already defined in the parent class  
   c) Using @staticmethod decorator to change a method’s behavior  
   d) Defining methods with different names but the same functionality  
   **Answer:** b) Redefining a method in a subclass that is already defined in the parent class

### ****Exception Handling****

1. **What is the output of the following code**

try:

x = 10 / 0

except ZeroDivisionError:

print("Division by zero!")

finally:

print("Finally block executed.")

1. a) Division by zero!  
   b) Finally block executed.  
   c) Division by zero! followed by Finally block executed.  
   d) Error  
   **Answer:** c) Division by zero! followed by Finally block executed.

### ****User-Defined Exceptions****

1. **What is the correct way to define a user-defined exception in Python?**  
   a) By creating a function that raises BaseException  
   b) By inheriting from the Exception class  
   c) By directly raising a string as an exception  
   d) By importing UserException from the exceptions module  
   **Answer:** b) By inheriting from the Exception class

### ****Regular Expressions Using Python****

1. **What does the following code output**

import re

pattern = r"^\d{3}-\d{2}-\d{4}$"

result = re.match(pattern, "123-45-6789")

print(bool(result))

1. a) True  
   b) False  
   c) Error: Invalid pattern  
   d) None  
   **Answer:** a) True

### ****Generators****

1. **What is the main advantage of using a generator in Python?**  
   a) Faster computation of results  
   b) Allows parallel execution  
   c) Provides memory-efficient iteration for large datasets  
   d) Automatically sorts data  
   **Answer:** c) Provides memory-efficient iteration for large datasets

### ****Decorators****

1. **What will be the output of the following code**

def decorator(func):

def wrapper():

print("Before function call")

func()

print("After function call")

return wrapper

@decorator

def test\_function():

print("Inside the function")

test\_function()

1. a) Before function call followed by Inside the function followed by After function call  
   b) Inside the function  
   c) After function call  
   d) Error  
   **Answer:** a) Before function call followed by Inside the function followed by After function call

### ****Working with Pandas****

1. **Which of the following operations in Pandas is used to combine data from multiple DataFrames?**  
   a) merge()  
   b) groupby()  
   c) filter()  
   d) apply()  
   **Answer:** a) merge()

### ****Matplotlib and Seaborn****

1. **What does the** hue **parameter in Seaborn’s** sns.scatterplot() **do?**  
   a) Changes the size of data points  
   b) Categorizes data points by color  
   c) Adds labels to data points  
   d) Creates 3D scatter plots  
   **Answer:** b) Categorizes data points by color

### ****NumPy and Data Cleaning****

1. **Which of the following functions in NumPy is used to handle missing data by replacing** NaN **values with a specified value?**  
   a) numpy.fillna()  
   b) numpy.nan\_to\_num()  
   c) numpy.replace\_nan()  
   d) numpy.handle\_nan()  
   **Answer:** b) numpy.nan\_to\_num()

### ****Object References****

1. **What is the result of the following code?**

class Demo:

pass

obj1 = Demo()

obj2 = obj1

print(obj1 is obj2)

1. a) True  
   b) False  
   c) None  
   d) Error  
   **Answer:** a) True

### ****Attributes and Data Hiding****

1. **How can you make an attribute private in a Python class?**  
   a) Prefix the attribute name with a single underscore (\_)  
   b) Prefix the attribute name with double underscores (\_\_)  
   c) Use the @private decorator  
   d) Declare the attribute with the private keyword  
   **Answer:** b) Prefix the attribute name with double underscores (\_\_)

### ****Overloading and Overriding****

1. **Which of the following is true regarding method overloading in Python?**  
   a) Python does not support method overloading.  
   b) Method overloading is achieved using default arguments.  
   c) Python uses the @overload decorator for method overloading.  
   d) Overloading requires specifying types explicitly.  
   **Answer:** b) Method overloading is achieved using default arguments.

### ****Exception Handling****

1. **What is the output of the following code**

try:

raise ValueError("Custom Error")

except ValueError as e:

print("Exception Caught:", e)

else:

print("No Exception")

finally:

print("Execution Complete")

1. a) Exception Caught: Custom Error followed by Execution Complete  
   b) No Exception followed by Execution Complete  
   c) Execution Complete  
   d) Error  
   **Answer:** a) Exception Caught: Custom Error followed by Execution Complete

### ****Logging in Python****

1. **Which method is used to log critical errors in Python’s** logging **module?**  
   a) logging.error()  
   b) logging.critical()  
   c) logging.exception()  
   d) logging.log\_critical()  
   **Answer:** b) logging.critical()

### ****Working with Pandas****

1. **What does the following Pandas code do:**

df['new\_col'] = df['col1'] + df['col2']

1. a) Creates a new column by concatenating col1 and col2 as strings  
   b) Creates a new column by adding the values of col1 and col2 element-wise  
   c) Multiplies the values of col1 and col2  
   d) Returns an error if col1 or col2 is missing  
   **Answer:** b) Creates a new column by adding the values of col1 and col2 element-wise

### ****Data Wrangling with Pandas****

1. **Which of the following is a key difference between** apply() **and** map() **in Pandas?**  
   a) apply() works only on DataFrames, while map() works only on Series.  
   b) apply() supports custom functions, while map() does not.  
   c) apply() can work on rows and columns, while map() works element-wise.  
   d) Both are interchangeable.  
   **Answer:** c) apply() can work on rows and columns, while map() works element-wise.

### ****Matplotlib and Seaborn****

1. **What will happen if you call** plt.show() **multiple times in a single script?**  
   a) The plot will only be displayed once.  
   b) Each call will open a new window for the plot.  
   c) It will overwrite the existing plot.  
   d) It will throw an error.  
   **Answer:** b) Each call will open a new window for the plot.

### ****Generators****

1. **What is the main difference between** return **and** yield **in Python?**  
   a) return exits a function, while yield pauses the function and saves its state.  
   b) return works only with lists, while yield works only with tuples.  
   c) yield permanently stops the function execution.  
   d) return and yield are interchangeable.  
   **Answer:** a) return exits a function, while yield pauses the function and saves its state.

### ****Decorators****

1. **Which of the following correctly describes a Python decorator?**  
   a) A function that takes another function as an argument and extends its behavior.  
   b) A function that modifies global variables.  
   c) A built-in Python module for logging.  
   d) A method for handling exceptions.  
   **Answer:** a) A function that takes another function as an argument and extends its behavior.

### ****Python Basics****

1. **What is the output of the following code**

print("Hello, World!")

a) Hello World  
b) Hello, World!  
c) Syntax Error  
d) None  
**Answer:** b) Hello, World!

### ****Data Types****

1. **Which of the following is NOT a valid Python data type?**  
   a) String  
   b) Integer  
   c) Float  
   d) Array  
   **Answer:** d) Array

### ****Flow of Control****

1. **Which keyword is used for branching in Python?**  
   a) if  
   b) switch  
   c) loop  
   d) case  
   **Answer:** a) if

### ****String Operations****

1. **What does the following string operation do**

s = "Python"

print(s[1:4])

1. a) Prints Pyt  
   b) Prints ytho  
   c) Prints yth  
   d) Prints Pyth  
   **Answer:** c) Prints yth

### ****Lists****

1. **Which method is used to add an element to a list in Python?**  
   a) add()  
   b) insert()  
   c) append()  
   d) extend()  
   **Answer:** c) append()

### ****Functions****

1. **What is the correct syntax for defining a function in Python?**  
   a) function myFunction():  
   b) def myFunction():  
   c) function = myFunction()  
   d) myFunction def():  
   **Answer:** b) def myFunction():

### ****Object-Oriented Programming****

1. **What is the purpose of the** \_\_init\_\_ **method in Python?**  
   a) To initialize a class  
   b) To define a class attribute  
   c) To create private variables  
   d) To initialize the attributes of an object  
   **Answer:** d) To initialize the attributes of an object

### ****Pandas****

1. **Which of the following is the correct way to create a DataFrame in Pandas?**  
   a) pd.DataFrame()  
   b) pandas.createDataFrame()  
   c) DataFrame.create()  
   d) pd.create()  
   **Answer:** a) pd.DataFrame()

### ****Exception Handling****

1. **Which keyword is used to handle exceptions in Python?**  
   a) catch  
   b) handle  
   c) except  
   d) tryexcept  
   **Answer:** c) except

### ****Matplotlib****

1. **Which function is used to display a plot in Matplotlib?**  
   a) plt.display()  
   b) plt.show()  
   c) plt.plot()  
   d) plt.graph()  
   **Answer:** b) plt.show()

### ****Python Basics****

1. **What is the extension of Python files?**  
   a) .txt  
   b) .py  
   c) .python  
   d) .p  
   **Answer:** b) .py

### ****Loops****

1. **Which keyword is used to exit a loop in Python?**  
   a) exit  
   b) stop  
   c) break  
   d) end  
   **Answer:** c) break

### ****Strings****

1. **What does the** len() **function do in Python?**  
   a) Counts the number of elements in a list  
   b) Calculates the length of a string  
   c) Both a and b  
   d) None of the above  
   **Answer:** c) Both a and b

### ****Lists****

1. **What is the index of the first element in a Python list?**  
   a) -1  
   b) 0  
   c) 1  
   d) None  
   **Answer:** b) 0

### ****Dictionaries****

1. **How do you access the value associated with a key in a dictionary?**  
   a) Using parentheses ()  
   b) Using curly braces {}  
   c) Using square brackets []  
   d) Using the get() method  
   **Answer:** c) Using square brackets [] and d) Using the get() method

### ****Functions****

1. **Which statement is correct about Python functions?**  
   a) Functions must always return a value.  
   b) Functions can have no arguments.  
   c) Functions cannot be nested.  
   d) Functions must have at least one parameter.  
   **Answer:** b) Functions can have no arguments.

### ****NumPy****

1. **Which function is used to create an array in NumPy?**  
   a) numpy.array()  
   b) numpy.arr()  
   c) numpy.create()  
   d) numpy.list()  
   **Answer:** a) numpy.array()

### ****Regular Expressions****

1. **What does** \d **represent in a Python regular expression?**  
   a) Any character  
   b) Any digit  
   c) Any whitespace  
   d) Any non-digit character  
   **Answer:** b) Any digit

### ****Pandas****

1. **Which method is used to read a CSV file in Pandas?**  
   a) pd.read\_csv()  
   b) pd.import\_csv()  
   c) pd.load\_csv()  
   d) pd.open\_csv()  
   **Answer:** a) pd.read\_csv()

### ****Python Basics****

1. **What will be the output of the following code?**

a, b, c = 5, 10, 15

print(a + b \* c)

1. 75  
   b) 155  
   c) 200  
   d) None  
   **Answer:** b) 155

### ****Control Flow****

1. **Which statement correctly uses the** else **block in a loop**

A.

for i in range(5):

print(i)

else:

print("Loop ended")

B.

while False:

print("Inside loop")

else:

print("Else block")

1. Both a and B
2. None

Answer:Both A and B

### ****Lists****

1. **What is the difference between** extend() **and** append() **in Python lists?**  
   a) extend() adds a single element, while append() adds multiple elements.  
   b) extend() adds elements from an iterable, while append() adds the iterable as a single element.  
   c) Both perform the same operation.  
   d) None of the above.  
   **Answer:** b) extend() adds elements from an iterable, while append() adds the iterable as a single element.

### ****Dictionaries****

1. **What will the following code output**

d = {"a": 1, "b": 2}

d["c"] = 3

print(len(d))

1. 2  
   b) 3  
   c) 4  
   d) Error  
   **Answer:** b) 3

### ****Functions****

1. **What is the difference between** \*args **and** \*\*kwargs **in Python functions?**  
   a) \*args is used for positional arguments, \*\*kwargs is used for keyword arguments.  
   b) \*args is for strings, \*\*kwargs is for numbers.  
   c) Both are interchangeable.  
   d) \*args is mandatory, \*\*kwargs is optional.  
   **Answer:** a) \*args is used for positional arguments, \*\*kwargs is used for keyword arguments.

### ****NumPy****

1. **What will the following code do**

import numpy as np

arr = np.array([1, 2, 3, 4])

print(arr + 2)

1. a) Adds 2 to each element in the array  
   b) Appends 2 to the array  
   c) Multiplies the array by 2  
   d) Raises an error  
   **Answer:** a) Adds 2 to each element in the array

### ****Regular Expressions****

1. **What does the** re.match() **function do in Python?**  
   a) Finds all matches of a pattern in a string.  
   b) Matches a pattern only at the beginning of the string.  
   c) Matches a pattern anywhere in the string.  
   d) Replaces a pattern in the string.  
   **Answer:** b) Matches a pattern only at the beginning of the string.

### ****Pandas****

1. **Which method is used to remove missing values from a Pandas DataFrame?**  
   a) fillna()  
   b) dropna()  
   c) isnull()  
   d) replace()  
   **Answer:** b) dropna()

### ****Exception Handling****

1. **Which of the following is true for the** finally **block in Python?**  
   a) It is always executed, regardless of whether an exception is raised or not.  
   b) It is only executed if an exception is raised.  
   c) It is optional and may or may not be executed.  
   d) It must be placed before the except block.  
   **Answer:** a) It is always executed, regardless of whether an exception is raised or not.

### ****Dictionaries****

1. **What will happen if you try to access a key that does not exist in a dictionary?**  
   a) Returns None.  
   b) Throws a KeyError.  
   c) Adds the key with a default value.  
   d) The program crashes.  
   **Answer:** b) Throws a KeyError.

### ****NumPy****

1. **What does the** np.zeros((2, 3)) **function do?**  
   a) Creates a 1D array of zeros with 2 elements.  
   b) Creates a 2D array of zeros with shape (2, 3).  
   c) Creates an array of zeros with dimensions based on system defaults.  
   d) Raises an error.  
   **Answer:** b) Creates a 2D array of zeros with shape (2, 3).

### ****Regular Expressions****

1. **Which of the following will match any single digit?**  
   a) [0-9]  
   b) \d  
   c) Both a and b  
   d) None of the above  
   **Answer:** c) Both a and b

### ****Pandas****

1. **Which function is used to check for missing values in a Pandas DataFrame?**  
   a) isna()  
   b) notnull()  
   c) fillna()  
   d) dropna()  
   **Answer:** a) isna()

### ****Exception Handling****

1. **What will the following code do:**

try:

print(10 / 0)

except ZeroDivisionError:

print("Division by zero is not allowed.")

1. Prints 10 / 0.  
   b) Raises a ZeroDivisionError.  
   c) Prints Division by zero is not allowed.  
   d) None of the above.  
   **Answer:** c) Prints Division by zero is not allowed.

### ****1. Basic R Concepts****

**What is the correct way to assign a value to a variable in R?**  
a) x <- 10  
b) x = 10  
c) Both a and b  
d) None of the above  
**Answer:** c) Both a and b

### ****2. R Environment****

**Which of the following is NOT a data type in R?**  
a) Vector  
b) List  
c) Matrix  
d) Schema  
**Answer:** d) Schema

### ****3. Functions****

**Which of the following functions is used to find the length of a vector in R?**  
a) size()  
b) len()  
c) length()  
d) count()  
**Answer:** c) length()

### ****4. Data Structures****

**What is the output of the following R code:**

**v <- c(2, 4, 6, 8)**

**v[3]**

a) 4  
b) 6  
c) 8  
d) Error  
**Answer:** b) 6

### ****5. Data Frames****

**Which function is used to combine columns into a data frame in R?**  
a) rbind()  
b) cbind()  
c) data.frame()  
d) bind()  
**Answer:** b) cbind()

### ****6. File Handling****

**Which function is used to import a CSV file in R?**  
a) read.csv()  
b) import.csv()  
c) load.csv()  
d) fetch.csv()  
**Answer:** a) read.csv()

### ****7. Packages in R****

**How do you install a new package in R?**  
a) install("package\_name")  
b) install.packages("package\_name")  
c) load.package("package\_name")  
d) library("package\_name")  
**Answer:** b) install.packages("package\_name")

### ****8. Mathematical Operations****

**What will the following code output**

**x <- 5**

**y <- 2**

**z <- x ^ y**

**Z**

a) 10  
b) 25  
c) 32  
d) 7  
**Answer:** b) 25

### ****9. Logical Operations****

**What is the result of the expression** TRUE & FALSE **in R?**  
a) TRUE  
b) FALSE  
c) NA  
d) Error  
**Answer:** b) FALSE

### ****10. Built-in Functions****

**Which function in R is used to calculate the mean of a numeric vector?**  
a) avg()  
b) sum()  
c) mean()  
d) average()  
**Answer:** c) mean()