

(Space for answers)

1. 5.0

3.141592653589793

114.59155902616465

1.0471975511965976

0.9092974268256817

0.8775825618903728

0.23414336235146527

24

2. 2

0.11457494351095043

48.1993970081534

800

(Output changes at every execution)

3. 21

3. 17.11877119.7397623

1970-01-06

XI. Exercise

Note: Faculty must ensure that every group of students use different input value.

(Use blank space for answers or attach more pages if needed)

1. Write a Python program to create a user defined module that will ask your college name and will display the name of the college.
2. Write a Python program that will calculate area and circumference of circle using inbuilt Math Module
3. Write a Python program that will display Calendar of given month using Calendar Module

(Space for answers)

1. A NumPy array is a multi-dimensional array object provided by the NumPy library. It is one of the fundamental data structures used in numerical computing and data analysis tasks. NumPy arrays offer several pros over lists:
 - ① Efficient storage
 - ② Fast operations
 - ③ Multi-Dimensional support
 - ④ Broadcasting
 - ⑤ Integration with other libraries
2.
 - ① Open Source & Free
 - ② Integration with Python Ecosystem
 - ③ Active Development & Community Support
 - ④ Performance & Efficiency
 - ⑤ Flexibility & Customization
 - ⑥ Cross-Platform Compatibility

XI. Exercise

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(Use blank space for answers or attach more pages if needed)

1. Write a Python program to create two matrices and perform addition, subtraction, multiplication and division operation on matrix.
2. Write a Python program to concatenate two strings.
3. Write a NumPy program to generate six random integers between 10 and 30.

(Space for answers)

** Extras **

1. Display student info using a package.

(Space for answers)

2. I eat only plants. I am vegetarian.
I breathe oxygen.

1. Method Overloading	Method Overriding
• Compile-time polymorphism	• Run-time polymorphism
• May or may not involve inheritance	• Involves inheritance
• Multiple methods having same name but different signature	• A single method with the same name & signature implemented in subclass
• Not directly supported in Python	• Supported in Python

XI. Exercise

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(Use blank space for answers or attach more pages if needed)

- Write a Python program to create a class to print an integer and a character with two methods having the same name but different sequence of the integer and the character parameters. For example, if the parameters of the first method are of the form (int n, char c), then that of the second method will be of the form (char c, int n)
- Write a Python program to create a class to print the area of a square and a rectangle. The class has two methods with the same name but different number of parameters. The method for printing area of rectangle has two parameters which are length and breadth respectively while the other method for printing area of square has one parameter which is side of square.
- Write a Python program to create a class 'Degree' having a method 'getDegree' that prints "I got a degree". It has two subclasses namely 'Undergraduate' and 'Postgraduate' each having a method with the same name that prints "I am an Undergraduate" and "I am a Postgraduate" respectively. Call the method by creating an object of each of the three classes.

(Space for answers)

1. ~~Code~~ Use of Inheritance:

- (i) Code Reusability: Avoids redundant code
- (ii) Hierarchy & Organization: Facilitates organizing & modelling complex systems.
- (iii) Extension: Subclasses can extend behaviour of their superclass
- (iv) Polymorphism: Enables writing more generic & flexible code
- (v) Maintenance: Promotes modular & hierarchical organization of code.

2. Types of Inheritance:

- (i) Single
- (ii) Multiple
- (iii) Multilevel
- (iv) Hierarchical
- (v) Hybrid

XI. Exercise

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(Use blank space for answers or attach more pages if needed)

1. Create a class Employee with data members: name, department and salary. Create suitable methods for reading and printing employee information
2. Python program to read and print students information using two classes using simple inheritance.
3. Write a Python program to implement multiple inheritance

(Space for answers)

Extras

1. Demonstrate use of multilevel inheritance.
2. Show working of hierarchical inheritance.

IX. Resources used (Additional)

Sr. No.	Name of Resource	Specification	Quantity	Remarks (If any)
1.	Computer System	AMD Ryzen 5300	1	
2.	Operating System	Windows 11		
3.	Development Software	IDLE		

X. Practical related Questions

Note: Below given are few sample questions for reference. Teachers must design more such questions to ensure the achievement of identified CO.

1. State Exception.
2. How to handle exception in Python?

(Space for answers)

1. An exception is an event that disrupts the normal flow of program execution due to an error or unexpected condition. An exception object is raised/thrown when an exceptional condition occurs, which can be caught by and handled by the program or propagated up the call stack until caught by an appropriate handler.

2. Syntax to handle exceptions:

```
try:
    # Code that may raise an exception
except [(Exception1, Exception2)]:
    # Handle the exception
else:
    # Execute if no exception occurs
finally:
    # Execute regardless of exception
    # occurrence
```