

- 1-c. What does single-level inheritance mean? (CO2) 1
- (a) A subclass derives from a class which in turn derives from another class
 - (b) A single superclass inherits from multiple subclasses
 - (c) A single subclass derives from a single superclass
 - (d) Multiple base classes inherit a single derived class
- 1-d. What will be the output of the following Python code? (CO2) 1
- ```
import sys
def function():
 pass
class MyObject(object):
 def __init__(self):
 pass
o = MyObject()
print(type({}))
```
- (a) <class 'function'>
  - (b) <class 'tuple'>
  - (c) <class 'object'>
  - (d) <class 'dict'>
- 1-e. What will be the output of the following Python code? (CO3) 1
- ```
ls=[1, -2, -3, 4, 5]
def f1(x):
    return x<2
m1=filter(f1, ls)
print(list(m1))
```
- (a) [1, 4, 5]
 - (b) Error
 - (c) [-2, -3]
 - (d) [1, -2, -3]
- 1-f. What will be the output of the following Python code? (CO3) 1
- ```
list(map((lambda x:x^2), range(10)))
```
- (a) [0, 1, 4, 9, 16, 25, 36, 49, 64, 81]
  - (b) Error

(c) [2, 3, 0, 1, 6, 7, 4, 5, 10, 11]

(d) No output

- 1-g. Which of the following is essential to create a window screen using tkinter ? (CO4) 1
- (a) Call Tk() function
  - (b) create a button
  - (c) To define a geometry
  - (d) All of the above
- 1-h. How we install tkinter in system ? (CO4) 1
- (a) pip install python
  - (b) tkinter install
  - (c) pip install tkinter
  - (d) tkinter pip install
- 1-i. Numpy in the Python provides the\_\_\_\_\_. (CO5) 1
- (a) Function
  - (b) Lambda function
  - (c) Type casting
  - (d) Array
- 1-j. What will be output for the following code? (CO5) 1
- ```
import pandas as pd
import numpy as np
s = pd.Series(np.random.randn(4))
print (s.ndim)
```
- (a) 0
 - (b) 1
 - (c) 2
 - (d) 3

2. Attempt all parts:-

- 2.a. What does the Self argument signify in the instance methods? (CO1) 2
- 2.b. What is the use of super() function? (CO2) 2
- 2.c. What are Closures in Python? (CO3) 2
- 2.d. How to erase everything from the Tkinter text widget? (CO4) 2
- 2.e. How to create a random 2-d array in python using numpy? (CO5) 2

3. Answer any five of the following:-

- 3-a. Write a program to deposit or withdraw money in a bank account. (CO1) 6
- 3-b. Write a class that stores a string and all its status details such as number of uppercase characters, vowels, consonants, space etc. (CO1) 6
- 3-c. What is method overriding? Explain it with an example. (CO2) 6
- 3-d. What is function polymorphism in python? Explain it with example. (CO2) 6
- 3.e. What is List Comprehension in Python? Describe its basic syntax. (CO3) 6
- 3.f. Give syntax of `int_slider`, `float_slider`, `int_range_slider` and `float_range_slider` in Ipywidgets. (CO4) 6
- 3.g. How can we sort the DataFrame? (CO5) 6

SECTION C

4. Answer any one of the following:-

- 4-a. Create a class called Numbers, which has a single class attribute called MULTIPLIER, and a constructor which takes the parameters x and y (these should all be numbers). (CO1) 10
- a. Write an instance method called add which returns the sum of the attributes x and y.
- b. Write a class method called multiply, which takes a single number parameter a and returns the product of a and MULTIPLIER.
- c. Write a static method called subtract, which takes two number parameters, b and c, and returns b - c.
- d. Write a method called value which returns a tuple containing the values of x and y.
- 4-b. Write a program that has a class Point with attributes x and y. (CO1) 10
- a. Write a method called midpoint that returns a midpoint of a line joining two points.
- b. Write a method called length that returns the length of a line joining two points.

5. Answer any one of the following:-

- 5-a. Explain the following with example: (CO2) 10
- a) MRO
- b) Super()
- 5-b. What is introspection in python? Explain type () function with an example. (CO2) 10

6. Answer any one of the following:-

- 6-a. What is functional Programming? How well does Python support Functional Programming? (CO3) 10

- 6-b. Describe the role of generators with its advantages. Write a program to illustrate the use of generator by creating a generator that reverses a string. (CO3) 10
7. Answer any one of the following:-
- 7-a. Write a program to display two labels with different background. Write a program to print a colored text on a colored background of GUI window. (CO4) 10
- 7-b. Write a program to display two buttons and print a message when a button is clicked. Write a program to display a text on the console when a button is pressed. (CO4) 10
8. Answer any one of the following:-
- 8 Explain series in pandas. How to create copy of series In pandas? (CO5) 10
- 8 Explain Numerical Integration and differentiation in SciPy. (CO5) 10