NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech (Integrated)

SEM: II - CARRY OVER THEORY EXAMINATION - SEPTEMBER 2022

Subject: Problem Solving using Advanced Python

Time: 3 Hours   Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.

2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.

3. Section B - Question No-3 is based on external choice carrying 6 marks each.

4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.

5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A   20

1. Attempt all parts:-

1-a.   Which of the following is type of namespace?   (CO1)   1

            (a) Enclosing

            (b) Global

            (c) built-ins

            (d) All of the above

1-b.   How many objects and reference variables are there for the given Python code?   (CO1)   1

```
class A:
    print("Inside class")
A()
A()
obj=A()
```

            (a) 2 and 1

            (b) 3 and 3

            (c) 3 and 1

            (d) 3 and 2

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

```python
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

```python
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

```python
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 <u>five</u> 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 6
characters , vowels ,consonants ,space etc.   (CO1)

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 6
Ipywidgets. (CO4)

3.g. How can we sort the DataFrame? (CO5) 6

SECTION C 50

4. Answer any <u>one</u> of the following:-

4-a. Create a class called Numbers, which has a single class attribute called MULTIPLIER, and a 10
constructor which takes the parameters x and y (these should all be numbers).
 (CO1)
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 <u>one</u> 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 <u>one</u> of the following:-

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

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 <u>one</u> 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 <u>one</u> 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