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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**

(An Autonomous Institute Affiliated to AKTU, Lucknow)

**MCA**

**SEM: III - THEORY EXAMINATION (2024- 2025)**

**Subject: Problem Solving using Python**

**Time: 3 Hours**

**Max. Marks: 100**

**General Instructions:**

**IMP:** Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

**SECTION-A**

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1. Attempt all parts:-

- 1-a. Which of the following is not used as loop in Python?(CO1,K1) 1
- (a) for loop
  - (b) while loop
  - (c) do-while loop
  - (d) None of the above
- 1-b. What is the output of the following code? (CO1, K3) 1
- ```
x = 10
y = 3
result = x // y
print(result)
```
- (a) 3
  - (b) 3.33
  - (c) 3.0
  - (d) None of the above
- 1-c. If return statement is not used inside the function, the function will return: 1
- (CO2,K3)
- (a) None
  - (b) 0
  - (c) Null

- (d) Arbitrary value
- 1-d. \_\_\_\_\_ are data items that have a fixed value.(CO2, K1) 1
- (a) Tokens
  - (b) Literals
  - (c) Keyword
  - (d) Operators
- 1-e. Under which pillar of OOPS do base class and derived class relationships come? (CO3,K2) 1
- (a) Polymorphism
  - (b) Inheritance
  - (c) Encapsulation
  - (d) Abstraction
- 1-f. \_\_str\_\_() function is refers to (CO3,K2) 1
- (a) string representation
  - (b) object representation
  - (c) both a and b
  - (d) none of the above
- 1-g. What is the output when we execute list("hello")? (CO4,K3) 1
- (a) ['h', 'e', 'l', 'l', 'o']
  - (b) ['hello']
  - (c) ['llo']
  - (d) ['olleh']
- 1-h. Suppose list1 is [2445,133,12454,123], what is max(list1)? (CO4,K3) 1
- (a) 2445
  - (b) 133
  - (c) 12454
  - (d) 123
- 1-i. In pandas, Index values must be?(CO5,K2) 1
- (a) unique
  - (b) hashable
  - (c) Both A and B
  - (d) None of the above
- 1-j. NumPY stands for? (CO5, K1) 1
- (a) Numbering Python
  - (b) Number In Python
  - (c) Numerical Python
  - (d) None Of the above

2. Attempt all parts:-

|      |                                                                                       |   |
|------|---------------------------------------------------------------------------------------|---|
| 2.a. | Define type conversion in Python. (CO1,K1)                                            | 2 |
| 2.b. | Define iterator in python.(CO2,K1)                                                    | 2 |
| 2.c. | Differentiate between <code>__new__</code> and <code>__init__</code> method. (CO3,K4) | 2 |
| 2.d. | How do you get a list of all the keys in a dictionary? (CO4,K3)                       | 2 |
| 2.e. | Differentiate between Matplotlib and NumPy. (CO5,K4)                                  | 2 |

## **SECTION-B**

30

3. Answer any five of the following:-

|      |                                                                                                                                             |   |
|------|---------------------------------------------------------------------------------------------------------------------------------------------|---|
| 3-a. | Explain different logical operators in python. (CO1,K2)                                                                                     | 6 |
| 3-b. | Write a program to enter two integers and perform all arithmetic operations on them. (CO1,K3)                                               | 6 |
| 3-c. | Demonstrate <code>map()</code> function with example. (CO2,K3)                                                                              | 6 |
| 3-d. | Illustrate the use of keyword arguments with example.(CO2,K2)                                                                               | 6 |
| 3.e. | Explain following built-in function defined in class: <code>getattr()</code> , <code>setattr()</code> and <code>delattr()</code> . (CO3,K2) | 6 |
| 3.f. | How to handle exceptions with try-except-finally? (CO4,K4)                                                                                  | 6 |
| 3.g. | Explain different ways to create DataFrame in Pandas. (CO5,K1)                                                                              | 6 |

## **SECTION-C**

50

4. Answer any one of the following:-

|      |                                                                                     |    |
|------|-------------------------------------------------------------------------------------|----|
| 4-a. | Briefly explain different data types in Python.(CO1,K2)                             | 10 |
| 4-b. | Write a program in Python to check whether a given number is prime or not. (CO1,K3) | 10 |

5. Answer any one of the following:-

|      |                                                                                                      |    |
|------|------------------------------------------------------------------------------------------------------|----|
| 5-a. | Explain different types of arguments supported by python with example.(CO2,K1)                       | 10 |
| 5-b. | Write a program to calculate the factorial of a given number using a user defined function. (CO2,K3) | 10 |

6. Answer any one of the following:-

|      |                                                                                                          |    |
|------|----------------------------------------------------------------------------------------------------------|----|
| 6-a. | How a constructor is invoked in Python? Also explain different types of constructors in Python. (CO3,K4) | 10 |
| 6-b. | Explain the 4 pillars of object-oriented programming Python?(CO3,K1)                                     | 10 |

7. Answer any one of the following:-

|      |                                                                                                                                                                                 |    |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 7-a. | Explain <code>NameError</code> , <code>ValueError</code> , <code>ZeroDivisionError</code> , <code>OverflowError</code> , <code>FloatingPointError</code> with example.(CO4, K1) | 10 |
| 7-b. | Discuss the Set Operations with help of suitable example.(CO4,K1)                                                                                                               | 10 |

8. Answer any one of the following:-

|      |                                                                                                                                       |    |
|------|---------------------------------------------------------------------------------------------------------------------------------------|----|
| 8-a. | Write a program to draw a line graph with x-label as "x" and y-label as "y" for the equation $y=mx+c$ . Here $m=2$ and $c=3$ (CO5,K3) | 10 |
| 8-b. | Describe at least five different types of widgets available in Tkinter and provide a brief explanation of each.(CO5,K1)               | 10 |