Enrolment No. /Seat No.: _____

# GUJARAT TECHNOLOGICAL UNIVERSITY
## MCA INTEGRATED – SEMESTER IV- EXAMINATION –WINTER-2025

**Subject Code: 2648601**                                      **Date: 27/11/2025**
**Subject Name: Python**
**Time:02:30 PM TO 05:00 PM**                          **Total Marks: 70**
**Instructions:**
    **1. Attempt all questions.**
    **2. Make Suitable assumptions wherever necessary.**
    **3. Figures to the right indicate full marks.**
    **4. Use of simple calculators and non-programmable scientific calculators are permitted.**

| | | |
|---|---|---|
| **Q.1** | **(a)** Do as Directed. | **07** |
| |    i)  Module | |
| |    ii)  Pandas | |
| |    iii) IDLE stands for_____ | |
| |    iv) What is the purpose of the head() method in a Pandas DataFrame? | |
| |    v)  What is quantifier? | |
| |    vi) What distinguishes a function from a method in Python? | |
| |    vii) tail() | |
| | **(b)** What is an object in Python? How does Python's object-oriented programming differ from procedural programming? Illustrate with an example. | **07** |
| | | |
| **Q.2** | **(a)** Explain the concept of iteration in Python. Write a program to print the Fibonacci series of 1 to 50 numbers using for loop. | **07** |
| | **(b)** What are list comprehensions in Python? How do they differ from for loops? Show a code snippet that creates a list of squares for numbers 1 to 10. | **07** |

**OR**

| | | |
|---|---|---|
| | (b) What is a recursive function? Illustrate its principles with an example. | **07** |
| | | |
| **Q.3** | **(a)** Explain lambda functions in Python with an example. Discuss their use with map(), filter(), and reduce() functions. | **07** |
| | **(b)** Write a Python function to check if a given string is a valid URL using regular expressions. | **07** |

**OR**

| | | |
|---|---|---|
| **Q.3** | **(a)** Write a Python program to count lines, words, and characters in a text file. | **07** |
| | **(b)** Differentiate between a function and a method. Illustrate the describe() method with an example. | **07** |
| | | |
| **Q.4** | **(a)** Define inheritance in OOP. Create a base class Animal with a speak() method, and derive Dog and Cat subclasses that implement speak() differently. Provide a code example. | **07** |

**(b)** What are the different operations can be performed on DataFrames?. Discuss **07** operations like filtering, grouping, and aggregating data with example.

**OR**

**Q.4** **(a)** Explain given function of pylab library with suitable examples. 1.figure(), **07** 2. plot(), 3.savefig(), 4.title(), 5.xlabel(), 6.ylabel(), 7. legend()

**(b)** What is Data frame? How it's used in python discuss with appropriate example. **07**

**Q.5** **(a)** What is Data visualization? Explain Pie Chart with Example. **07**

**(b)** What is database adapter? Write a Python program to perform insert update **07** and delete operations with the given table: (employee (EMP_ID, EMP_NAME, EMP_PROJECT)).

**OR**

**Q.5** **(a)** What is Regular Expression? Explain re module to perform basic regex **07** operations such as searching and matching patterns in strings.

**(b)** Create a Python program that uses the object-oriented paradigm to calculate **07** and display simple interest and compound interest on a chart using PyLab. Highlight the differences between the two.

\*\*\*\*\*\*