United International **University (UIU)**
Dept. of Computer Science & Engineering (CSE)

CT-1

DS 1115: Object-Oriented Programming for Data Science
Total Marks: **20** Duration: 30 Minutes

1. Explain the concept of a class and an object in Python, and how they are used to model real-world entities in a program. **[2.5 Marks]**

2. What is the purpose of the `self` parameter that is passed inside the functions of a class? **[2.5 Marks]**

3. You are building a basic messaging system, and you want to create a class called `Message` to represent individual messages. The `Message` class should have the following attributes: **[3x5 = 15 Marks]**

- `sender` (str): representing the sender of the message.
- `recipient` (str): representing the recipient of the message.
- `content` (str): representing the content or body of the message.
- `timestamp` (str): representing the timestamp when the message was sent.

a) Define the `__init__` method for the `Message` class to initialize these attributes.

b) Implement a method named `display_message()` in the `Message` class that prints out the information about the message in a readable format, such as "From: [sender], To: [recipient], Content: [content], Sent at: [timestamp]".

c) Create an instance of the `Message` class with the sender "Alice," recipient "Bob," content "Hello, how are you?" and a timestamp indicating the current date and time.

d) Call the `display_message()` method on the created `Message` instance to showcase its information. Now update the `content` of this instance to "Hello Alice, how are you?" and the `timestamp` to yesterday's date and time.

e) Instead of using a string to represent the `timestamp`, would a separate `Timestamp` class be better in this case? If yes, why? What should be the attributes of this new `Timestamp` class? What should the `__str__()` function for this class return?