COMSATS University Islamabad
Sahiwal Campus

Course Title:	Object Oriented Programming	Course Code:		CSC241	Credit Hours:	4(3,1)
Course Instructor:	Syed Ameer Ahmed Gillani	Programme Name:		BS (SE)		
Semester:	3rd	**Batch:** FA24	**Section:**	A,B	Date:	
Time Allowed:			Maximum Marks:		10	
Student's Name:			Reg. No.	CUI/		/SWL

CLOs Addressed	CLO1			CLO2		
	Question Nos.	Max. Marks.	Obtained Marks	Question Nos.	Max. Marks.	Obtained Marks
	1	10				

Assignment # 01

CLO-01: Demonstrate fundamental principles and concepts of object-oriented programming.

Question 1:   [2 x 5 = 10]

1. **Explain** the difference between a class and an object in object-oriented programming. Provide an example of a class and how an object is created from it in a programming language of your choice.
2. **Explain** passing objects and array of objects from a method in Java. Provide an example of both in the form of a code.
3. **Define** encapsulation, and why is it important in OOP? Describe how encapsulation is achieved in a programming language like Java, using an example.
4. **Explain** the concept of polymorphism in OOP. Differentiate between compile-time polymorphism (overloading) and runtime polymorphism (overriding) with examples.
5. A shopping center wants to develop a system to manage products, customer purchases, and invoices while rewarding customers with loyalty points.
   - The Shopping Center has multiple Products available for purchase.
   - Each product has a name and a price.
   - A Customer can purchase one or more products.
   - When a customer makes a purchase, an invoice is generated with products purchased, total bill, Applied discounts (if any)
   - Customers earn loyalty points based on their total purchase amount. (For example, 1 point for every $10 spent).

   Questions:
   1. Identify the classes needed for this system.
   2. List the attributes for each class.
   3. Define the methods required for each class.