COMSATS University Islamabad
Abbottabad Campus

DEPARTMENT OF COMPUTER SCIENCE
Examination - Midterm (FA-25)

27/10/25

CLASS: BSE-3C
SUBJECT: Object Oriented Programming
TIME: 90 Minutes
NAME: _____

DATE: October 31, 2025
INSTRUCTOR: Nauman Khan
MARKS: 30 Marks
REG # _____

NO QUESTION ALLOWED DURING EXAM, PAPER IS SELF EXPLAINATORY
WRITE YOUR FULL NAME AND FULL REG. # ON QUESTION PAPER AND RETURN WITH ANSWER SHEET

SECTION- A CLO1-C2: (Understanding)

Q # 1: BRIEFLY ANSWER QUESTIONS GIVEN BELOW: *(CLO-1, 3x5=15 MARKS)*

A. ***Describe*** the concept of Object-Oriented Programming. ***Define*** class and object and show how a class represents state (fields) and behavior (methods) with a short Java example.

B. ***Explain*** how a method differs from a constructor in Java. Give at least two key differences with a short example showing both in the same class.

C. ***Critically analyze*** concept of encapsulation in Java? Suppose you make an attribute ***public***.
- What risk does it introduce?
- How can getter/setter fix this without changing program output? Write a short code snippet to support your answer.

D. ***Define*** a Circle class with a private attribute radius. Write a constructor that initializes the radius value when the object is created. Implement suitable setter and getter methods to modify and retrieve the radius with the value entered by user at run time. Finally, create a Circle object in the main() method and use it to display the area of the circle.

E. Consider the following code and answer the questions:

```
package com.example.test;

public class Address {
    public String city;
    public int postCode;
}
```

```
package com.example.test1;

public class Student extends Person{
    public  void print(){
        // prints the value of name, age, address
    }
}
```

```
package com.example.test;

public class Person{
    private String name;
    private int age;
    private Address address;

    Person(){
        name = "Tamim Iqbal";
        age = 35;
        address = new Address();
        address.postCode = 1200;
        address.city = "Dhaka";
    }
}
```

- Suggest two modifications in the Person class so that the class variables can be accessible from Student class. You are not allowed to use the public keyword for the variables.
- Add the necessary code lines in Student class so that it can access variables in Address and Person classes.

8 principle.

1

9, 10, 11 → C.S → 9] 18

22 → C.S → 9

CamScanner

SECTION- B CLO2-C2: (Applying)

Q # 2: ATTEMPT ALL THE QUESTIONS GIVEN BELOW *(CLO-2, 9+6=15 MARKS)*

A. *Demonstrate* how inheritance works in Java and explain how it promotes code reusability and improves software maintenance. Also, describe the types of inheritance with relevant real-life examples, and analyze the given Java code snippet to determine its expected output.

```
class A{
public int amount;
      A(int j){
            amount -= j;
       }
       void show(){
            amount += 300;
            System.out.println("Parent Amount Status "+amount);
       }
}//parent

class B extends A{
int amount;
      B(){
            Super(700);
       }
       void Update(int j){
            amount = 500;
       }
       void show(){
            super.show();
            System.out.println("Child Amount Status "+amount);
       }
}//child

class Exam2{
public static void main(String[] str){
      B ob1 = new B();
      Ob1.Update(100);
      Ob1.show();

      A ob3=new A(-900);
      ob3.show();
}     }
```

B. *Construct* a class Employee that contains attributes of employee id and scale. The class contains two methods to input () and show () the attributes. Write a child class Manager that inherits Employee class. The child class has attributes of manager id and department. It also contains methods to input () and show () its attributes.

-- END OF PAPER --

--- GOOD LUCK ---

CamScanner