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Daffodil International University
Faculty of Science & Information Technology
Department of Software Engineering
Midterm Examination, Summer 26
Course Code: SE216; Course Title: Object Oriented Programming
Sections & Teachers: UKD(A,B,C), RJM(D,E,H), MBH(F), MSN(G), AJE(I), MIH(J)
Time: 1 Hour 30 Mins **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1. a) **Convert** the below JAVA Code to the appropriate **Class Diagram.** **[5]** **CLO -2 Level -2**

```
public class Movie {
   protected String title;
   void showMovie() {
      System.out.println("Movie: " + title);
   }}
public class Horror extends Movie {
   void showMovie() {
      System.out.println("Horror Movie: " + title);
}
   protected void showHorror() {
      System.out.println("Scare Level: Goosebumps ");
   }}
public class Thriller extends Movie {
   String suspenseLevel;
   public void showThriller() {
      System.out.println("Suspense Level: " + suspenseLevel);
   }}
public class SupernaturalHorror extends Horror {
   String ghostType;
   protected void showHorror() {
System.out.println("Supernatural Horror Level: creepy");
   }}
public class PhysicalHorror extends SupernaturalHorror {
   private String injuryType;
   public void showInjury() {
      System.out.println("Physical Injury: " + injuryType);
   }}
```

b) A university is developing an employee management program. The system is divided into two packages named **pack1 and pack2. Rewrite** & design the classes using correct **access modifiers.** **[5]**

Package 1: pack1 holds class **Employee**

1. Class level: The class should be accessible from other packages.
2. **Variables**:
   - name: accessible only inside the same package
   - salary: accessible within the same package and in subclasses outside the package
   - id: should be fully hidden and only accessible inside the class
   - university: accessible from everywhere
3. **Method: showDetails():** display all employee information and be accessible from other packages.

Package 2: pack2 holds class **Main**

Tasks: Inside the Main class

- Create an object(non-parameterized) of Employee named **spy**
- Try to access all variables directly: variables (name, salary, id, university)
- Call showDetails() method

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Observe and write:

- which ones are accessible from the class Main
- which ones give error
- why they are not accessible

c) Compute the output of the following code: **[5]**

```
public class Argentina {
   int score = 3;
   int bonus;
   static double rating = 10.5;
   public Argentina() {
      System.out.println("3 world cups");
   }
   public Argentina(int x) {}
   public void matchStart() {
      rating = 15.5;
      score = 6;
      System.out.println("Score: " + score);
      System.out.println("Rating: " + rating);
   }
   public void playGame() {
      int bonus= 50;
      System.out.println("Bonus Points: " + bonus);
      System.out.println("Score: " + score);
      rating= 20.0;
   }
```

```
public void showStats() {
      System.out.println("Score " + score);
      System.out.println("Bonus " + bonus);
      System.out.println("Rating: " + rating);
   }
public static void main(String[] args) {
      Argentina p1 = new Argentina();
      Argentina p2 = new Argentina(4);
      p2.matchStart();
      p1.playGame();
      p1.matchStart();
      p2.showStats(); }}
```

2. **Observe** the given code below to write a **Player & StarPlayer class** (Design class) to get the output as shown. Here, you have to deal with **Upcasting, constructor overloading and method overloading, Inheritance. // Rewrite your design codes here:** **[10]** **CLO -1 *Level -2***

Driver Code:

```
public class Main {
   public static void main(String[] args) {
      Player p1 = new Player("Messi", "Playmaker");
      Player p2 = new StarPlayer();
      StarPlayer p3 = new StarPlayer("Neymar");
      p1.showInfo();
      p2.showInfo();
      p3.showInfo();
      p1.updateStats(7);
      p2.updateStats(5);
      p3.updateStats("Neymar", "Winger");
      p1.updateStats("Captain");
      p1.Skill();
      p3.specialSkill();
   }}
```

Expected Output:

Messi is the star player
Unknown Star Player
Neymar is the star player
Messi scored 7 goals
Unknown Player scored 5 goals
Neymar played as winger
Messi played as captain
A Magical dribbler
A Clinical Finisher