

Object Oriented Programming, Summer 2021 Midterm Exam Solution

1a)

Provide the Person class with a constructor with parameters.
Provide the Person class with setters and getters to access the values.

1b)

```
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";
    }

    public String getName() {
        return name;
    }
    public int getAge() {
        return age;
    }
    public Address getAddress() {
        return address;
    }
    public void setName(String name) {
        this.name = name;
    }
    public void setAge(int age) {
        this.age = age;
    }
    public void setAddress(Address address) {
        this.address = address;
    }
}
```

2)

```
class EBook extends Book {
    public String format;
    public EBook() {
        super(0, 0);
    }
    public EBook(int chapters, int pages, String format) {
        super(chapters, pages);
        this.format = format;
    }
    public void printSummary() {
        super.printSummary();
        System.out.println("Format: " + format);
    }
}
```

Output:

```
> $ Chapters: 0
> $ Pages: 0
> $ Format: null
> $ Chapters: 8
> $ Pages: 500
> $ Format: pdf
```

3)

```
class Item {
    String name;
    double price;
    public double getPrice() {
        return price;
    }
}
class DiscountedItem extends Item {
    double discount;
    public DiscountedItem(String name, double price, double discount) {
        this.name = name;
        this.price = price;
        this.discount = discount;
    }
    public double getPrice() {
        return price - (price * (discount/100));
    }
}

public class Shop {
    public static void main(String[] args) {
        Item[] items = new Item[5];
        items[0] = new DiscountedItem("T-Shirt Avengers", 19.99, 5);
        items[1] = new DiscountedItem("Glasses SunLite", 24.95, 10);
        items[2] = new DiscountedItem("Watch Tistot", 65.95, 15);
        items[3] = new DiscountedItem("Hat DeMordan", 30, 20);
        items[4] = new DiscountedItem("Belt Black", 20, 25);
        double sales = 0;
        for(Item i: items) {
            sales += i.getPrice();
        }
        System.out.println("Total sales: " + sales);
    }
}
```

```
}  
}
```

4)

```
package Ex01.movies;  
  
public class Titanic {  
    public String directorName;  
    public String featuredSong;  
  
    public Titanic(String directorName, String featuredSong) {  
        this.directorName = directorName;  
        this.featuredSong = featuredSong;  
    }  
    /*block*/{  
        System.out.println("Titanic sank in the North Atlantic Ocean "  
                            + "on 15 April 1912 after striking an iceberg");  
    }  
    public void showDetails() {  
        System.out.println("Director: " + directorName);  
        System.out.println("Featured Song: " + featuredSong);  
    }  
    public static void main(String[] args) {  
        Titanic titanic = new Titanic("James Cameroon", "My Heart Will Go On");  
        titanic.showDetails();  
    }  
}
```

5)

```
abstract class Vehicle {  
    abstract void move();  
    abstract void permission();  
}  
  
abstract class MotoVehicle extends Vehicle {  
    void move() {  
        System.out.println("Burning engine fuel");  
    }  
    void refill_tank() {  
        System.out.println("Filled with fuel");  
    }  
}  
  
class Rickshaw extends Vehicle {  
    public void move() {  
        System.out.println("Paddling the chain");  
    }  
    public void permission() {  
        System.out.println("Rickshaw can move in narrow streets");  
    }  
}  
  
class CNG extends MotoVehicle {  
    void permission() {  
        System.out.println("CNG can move in city streets");  
    }  
}
```

```
    }  
}  
  
class Car extends MotoVehicle {  
    void permission() {  
        System.out.println("Car can move in highway");  
    }  
}  
  
class Bus extends MotoVehicle {  
    void permission() {  
        System.out.println("Bus can move in expressway");  
    }  
}
```