Question 1

(a) What are the Open/Closed, the Liskov Substitution, and the Dependency Inversion principles? [3 marks]

(b) Explain how the Open/Closed and the Liskov Substitution principles are automatically satisfied when the Dependency Inversion principle is adhered to. [6 marks]

(c) Consider the code snippet below in relation to the Single Responsibility (SR) Principle:

```
public class Customer{
   //state variables and constructors
   public void storeOrder(Order o){ ... }
   public Order findOrder(int orderID){ ... }
   public boolean cancelOrder(Order o){ ... }
   public String getCustomerName(){ ... }
   public String getCustomerAddress(){ ... }
   public String getCustomerEmail(){ ... }
}
```

Figure 1

Assuming that there are no errors in the code in Figure 1:

(i) Explain how the SR principle is being violated. [2 marks]

(ii) Discuss how you would refactor the code so that the SR principle is followed. [2 marks]

(iii) Identify ONE substantial benefit of following the SR principle. [1 mark]

(iv) Suggest a simple technique that a programmer can use to avoid violating the SR principle when adding a new feature to an existing class. [2 marks]

TOTAL MARKS: 16 marks