E1. Write an efficient function to find the first nonrepeated character in a string. For instance, the first nonrepeated character in "total" is 'o' and the first nonrepeated character in "teeter" is 'r'. How efficiency is your algorithms?

E2 Write a function that finds the longest word in a given string. The longest word is the word has the most number of characters. For example, the longest word of the string "We are the champions" is "champoins".

E3. Assume you have the class hierarchy such as:

B extends A; C extends B; D extends A

And a function:

void f(B x);

Which classes of objects can you pass to the function?

E4. Given:

```
public class Mirror {
    int size = 7;
    public static void main(String[] args) {
        Mirror m1 = new Mirror();
        Mirror m2 = m1;
        int i1 = 10;
        int i2 = i1;
        go(m2, i2);
        System.out.println(m1.size + " " + i1);
    }
    static void go(Mirror m, int i) {
        m.size = 8;
        i = 12;
    }
}
```

What is the result?

- A. 7 10
- B. 8 10
- C. 7 12
- D. 8 12
- E. Compilation fails
- F. An exception is thrown at runtime

E5. Given:

```
public class OverAndOver {
    static String s = "";
    public static void main(String[] args) {
        try {
            s += "1";
```

```
            throw new Exception();
        } catch (Exception e) {
            s += "2";
        } finally {
            s += "3"; doStuff(); s += "4";
        }
        System.out.println(s);
    }
    static void doStuff() { int x = 0; int y = 7/x; }
}
```

What is the result?

- A. 12
- B. 13
- C. 123
- D. 1234
- E. Compilation fails
- F. 123 followed by an exception
- G. 1234 followed by an exception
- H. An exception is thrown with no other output

E6. Given a database as below:

- Supplier(name, address) // name is the primary key
- Product(title, price, year, sname) // tile is the primary key and sname is a foreign key references to Supplier's name
- Order(product, quantity, delivered) //product is a foreign key references to Product.title

a. Write a SQL query to select all Product with price > 1000 and show they Supplier's name.

b. Write a SQL script to update delivered = true for all Order with product = "Iphone XS Max"

c. Write a SQL query to show total number of products has ordered for each Supplier.

E7. How many ways are there to split a dozen people into 3 teams, where one team has 2 people, and the other two teams have 5 people each?