United International University
Department of Computer Science and Engineering

CSE 3421: Software Engineering Mid : Fall 2023

Total Marks: 30 Time: 1 hour 45 minutes

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.

Answer all the questions. Numbers to the right of the questions denote their marks.

1. (a) Explain Git & GitHub. (2)

   (b) You're inside a project folder from a terminal emulator software. Now write down the commands to perform the tasks. (4)

   I Configure your name and email as the username & email for the git program respectively.

   II Initiate a git repository being inside the specified folder.

   III Create a file named start.txt. And commit the change. Show the status of git

   IV Create a new branch "design" and checkout to it. Create two files "home.txt", "road.txt". Then commit these changes.

   V Checkout to master branch. Create a file "tree.txt". Merge with branch "design". Delete the "design" branch.

   VI Checkout to the commit with hash d7b7953. Now, delete all commits made after this.

2. (a) Which types of **software documentation** are more beneficial for **the current and potential users** of a software? **Describe** these documentation in brief. (2)

   (b) The disastrous situation of Dengue in the country has forced the government to develop a Medical Software that will keep track of all the Dengue patients and manage all hospital information and all other necessary medical steps to make the healing process better. Your team has been assigned to design this project. The project is very sensitive and must work without any major flaws. There is a good degree of complexity to this project, and the government has allowed you ample time to build the project. The government wants to analyse future situations, and change the requirements whenever it is required. (4)
   Which **model** should be used to build the project? **Explain** with **proper reasoning**. **Describe** the model's working principles.

3. (a) What is the **difference** between **Requirement Verification** and **Requirement Validation** ? (2)
   Explain with suitable **examples**.

   (b) Shakib is using the BCB software. Shakib visits Tamim's profile. Shakib is very smart, and with a little tweaking, he posts as Tamim on Tamim's profile that *I will not be playing the World Cup*. Shakib is also able to access Tamim's conversations with Papon. Shakib changes Tamim's username to DotBaba. (4)
   Which **security properties** are being **violated** in the above scenario? **Explain** these properties with **proper reasoning**.

4. (a) **Describe** the Scrum roles: **Product Owner** and **Scrum Master**. What is the **major difference** between these two roles? (2)

   (b) **Describe** the XP key principles: **Simple Design** and **Small Releases**. Write an **advantage** and a **disadvantage** for each principle. (4)

5. Refactor the following code. (6)

```java
public class FairPhone {
    private double displaySize;
    private Battery battery;
    private String networkProvider;

    public void swapBattery() {
        System.out.println("Swap-
            done");
    }
}
```

```java
public class IPad {
    private double displaySize;
    private Battery battery;

    public void swapBattery() {
        System.out.println("Error!-
            Swap-not-possible");
    }
}
```

```java
public class IPhone {
    private double displaySize;
    private Battery battery;
    private String networkProvider;

    public void swapBattery() {
        System.out.println("Error!-
            Swap-not-possible");
    }
}
```

```java
public class Battery {
    private int capacity;
}
```

```java
public class ICEVehicle {
    private double engineCapcity;

    public void swapBattery() {
        System.out.println("Error!-
            Swap-not-possible");
    }
}
```

```java
public class ElectricVehicle {
    private Battery battery;
    private double engine_capcity;

    public void swapBattery() {
        System.out.println("Swap-
            done");
    }
}
```