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**Matric no: 18/ENG/022**

**A. Discuss the application development following the software development cycle**

Software Development Cycle (SDC) is a process used by the software industry to design, develop and test high quality software. It is also called as Software Development Process. SDC is a framework defining tasks performed at each step in the software development process.

**Conceptualization**

Software Development Cycle (SDC) is a process used by the software industry to design, develop and test high quality software. It is also called as Software Development Process. SDC is a framework defining tasks performed at each step in the software development process.

The application to be created is an irrigation system software that can:

1. Read the temperature of the soil and determine its moisture content
2. Configure a time interval for the water system (based on 1 and 2)
3. Lastly trigger an alarm indicating no sufficient water in the tank for the irrigation
4. The system will also require security, hence a password is enabled

**B. Critically discuss the hardware and software features**

**Specification**

Hardware

* Soil temperature measuring instrument

In soil temperature measurement, the system, PT100 platinum resistance thermometers (PRT) are used to measure the temperature of the soil. PRT’s are widely used in automated systems to measure temperature in place of traditional mercury in glass or spirit type thermometers

* Soil moisture measuring instrument

Portable and stationary tensiometers measure the soil moisture content as a tension or pressure range Tensiometers fundamentally act in a similar fashion to a plant root measuring the force that plants have to exert to obtain moisture from the soil. To measure the temperature of the soil, an instant-read thermometer probe is pushed as deep into the soil as possible to get an accurate reading of the soil temperature and the moisture is measured from the plant roots these are sent to the irrigation system to determine if water is needed in the system.

* Alarm system
* Security system
1. **Support your answer with a flowchart and algorithm**

STEPS

1. Start
2. Print “Input password”
3. If password is correct

Print “Welcome user”

Else

Print “Incorrect pass word, please insert correct password”

1. Required soil temperature= 65 to 75 F.
2. Required soil moisture= 5 to 45
3. Required water level=2,000 liters
4. Read soil moisture

If soil moisture =required soil moisture

Print “Soil moisture is okay”

Else

Print “Soil moisture doesn’t match required moisture”

 Trigger irrigation system

1. Read soil temperature

If soil temperature =required soil temperature

Print “Soil temperature is okay”

Else

Print “Soil temperature doesn’t match required temperature”

Trigger irrigation system

 9. If water level in tank is not equal to required level

Trigger alarm to indicate water is insufficient

Else

Terminate and Stop

 10. Stop

START

Input password

**FALSE**

TRUE

Required password=inputted password

Incorrect pass word, please insert correct password

Welcome user

Required soil temperature= 65 to 75 F

Required soil moisture= 5 to 45

Required water level=2,000 liters

Read soil moisture

Soil moisture is okay

If soil moisture =required soil moisture

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Trigger irrigation system

Print “Soil temperature is okay”

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Trigger irrigation system

Terminate and Stop

If water level in tank is not equal to required level

Trigger alarm to indicate water is insufficient

STOP