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DEPT: MECHANICAL ENGINEERING

MATRIC NO: 18/ENG06/056

Consulted as a software engineer to develop a software that interacts with the machine and the software must be able to:

i)   Read the temperature of the soil.
ii)   Determine the moisture content of the soil
iii)   Configure the time interval for the water system based on the above
iv)   Trigger an alarm if there is no sufficient water in the tank for irrigation, and enable password for the system
A) DISCUSS THE APPLICATION DEVELOPMENT FOLLOWING THE SOFTWARE DEVELOPMENT CYCLE.

CONCEPTUALISATION: Due to the major challenges of ABUAD farm, Ado Ekiti during the dry season. which is the irrigation system of the farm. We are consulted to develop an automated machine which will enable the staff to (i) access the temperature of the soil (ii) determine the moisture content of the soil. and that can be only accessed by the ABUAD farm staffs

Some hard ware and software features of the system

Hardware Features

1. Bimetallic Thermometer: The bimetallic thermometer can be used to control the alarm system by sending information about the soil temperature.
2. Alarm system: use to signal the users on the condition of the soil
3. Torsiometer: This will measure and determine the matrix water potential (soil moisture tension) of the soil
4. Watering Tank and water emitters: used in store and distribution of water
5. Digital clock system: Use for the display of time and in timing the system processes

Software Features

1. Biometric system: used to confirm or determine the user's status based on behavioral characteristics such as finger prints, voice and facial patters for security reasons
2. Input/output Operations: This is used to control the input and output operations
3. Internal Storage: Used to d store Vital information of the farm and soil

ALGORITHM

1. Start
2. Enter temperature = t, time = T, power = P
3. Check if P is Enough
4. If p is enough sound alarm
5. Else P is enough
6. Get value of t
7. If t<75f don't dispense
8. Else wait for T = T+8 hours
9. Then go back to line 5
10. If t == 75f don't dispense
11. Else wait for T = +8hours
12. Go back to line 6
13. If t > 75f dispense water
14. Else
15. Close

Flochart

```
                    ( start )
                        |
                        v
            / Enter temperature = t /
           / time = T, Power = P   /
                        |
                        v
          < check if P is enough >------ True ---+
                        |                         |
                     False                        v
                        |                  +---------------+
                        v                  | sound alarm   |
              +-------------------+        | P is enough   |
              | sound   alarm     |        +---------------+
              +-------------------+
                        |
                        v
                  < t < 75°f >------ True ---+
                        |                     |
                        |                     v
                        |             +-----------------+
                        |             | don't disperse  |
                        |             | water           |
                        |             +-----------------+
                        v
              +-------------------+
              | wait for T = 18hs |
              +-------------------+
                        |
                        v
                  < if t          >------+
                  < = = 75°f >           |
                        |                v
                        |        +----------------+
                        |        | don't dispus   |
                        |        | water          |
                        |        +----------------+
                        v
              +-------------------+
              | wait for          |
              | T = 18 hours      |
              +-------------------+
                        |
                        v
                  < if           >------+
                  < t > 75°f >          |
                        |               v
                        |        +----------------+
                        |        | disperse water |
                        |        +----------------+
                        v
                    +-------+
                    |  End  |
                    +-------+
```
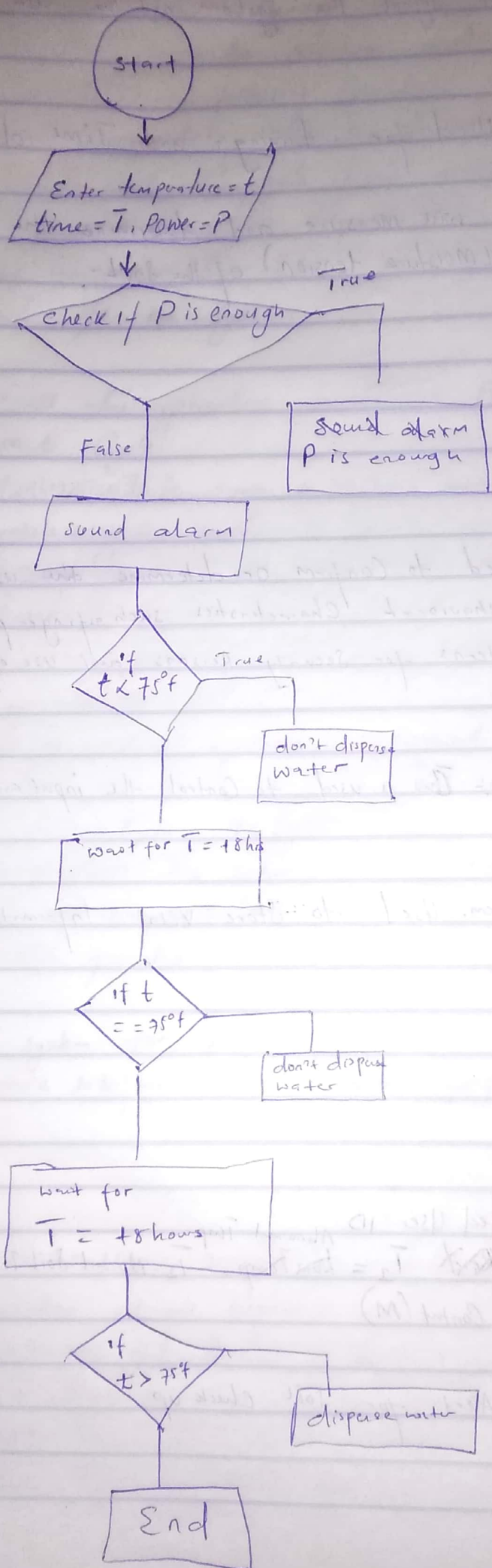
IRRIGATION SYSTEM

CHECK SOIL MOISTURE	ALARMING SYSTEM	TEMPERATURE SYSTEM	Security System	SYSTEM STORAGE SYSTEM
↓	↓	↓	↓	↓
tensers Tensiometer	BIMETALLIC STRIP and Alarm Sound system	Thermometer	Biometric Software	ROM → Read Only Memory