DESIGN AND CONSTRUCTION OF AN ELECTRONIC TIMED MOSQUITO FLEETING SYSTEM

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MATRICULATION NUMBER:

2005/23274EE

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

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A FINAL YEAR PROJECT SUBMITTED TO THE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE AWARD OF THE BACHELOR OF ENGINEERING (B. ENG.) DEGREE IN ELECTRICAL AND COMPUTER ENGINEERING

NOVEMBER, 2010.

DEDICATION

This work is dedicated to the Almighty God for protecting me and guiding me throughout my stay in this school and to my family for encouraging me and believing in me.

DECLARATION

I Ozoemena Tochukwu .U.J, declare that this work was done by me and has never been presented elsewhere for the award of degree. I also hereby relinquish the copyright to the Federal University of Technology, Minna.

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ACKNOWLEDGEMENT

My most profound gratitude goes to the Almighty God for seeing me through all my life endeavors, to him is the glory.

I am particularly indebted to my project supervisor; Mr. Oyewobi stephen whose commitment to this project work at all stages gave me encouragement. I am indebted to entire staff of the department whose effort, criticism and remarks did a lot of good to me and my work.

My profound gratitude goes to my dearest parents Mr. and Mrs. A.N Ozeomena whose effort and support helped me to actualize my dream. In fact, I appreciate the moral and financial support given to me by my Uncles, Barr. Chijioke Ozoemena, Mr. Okwy Aroh, and Engr. Okey Ozoemena, my aunt, Mrs. Uche Illomecheziena and my mentors, Miss Ifeanyiwa Ozoemena and Mr. Emeka Ozoemena, who are always assiduous to the success of my program.

I appreciate the assistance, advice and encouragement rendered to the success of my program in one way or the other by my cousins Ozoemena Kizito and Gael Okoyeuzo. My acknowledgment will not be complete without remembering my love, Miss Tamaramiebi Graham Douglas and to all my friends; Oladapo Apara, Saka Bemdoo, Alogidi Yenlayefa, Michelle Terdoo Gbashah, Rachel Ikwo Idim, Ikem Ebubechukwu, Lydia Gana, Adaji Ibrahim, all the 500 level students of Electrical and computer Engineering Department, and to the entire Loyola Jesuit college family especially LJC class of 2005, may God take us to greater heights.

ABSTRACT

The electronic timed fleeting system works with a circuit that acts like a clock, the main part of my project is the timer circuit that acts like a switch, once the user sets the time on the panel, the circuit automatically supplies power to the fleeting mechanism that fleets/sprays the room once the specified time is reached. The circuit is left on for a while then it goes off and waits for the next time it has to come on.

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CHAPTER ONE

1.0 INTRODUCTION

Malaria, which kills more than a million persons every year, is most deadly among children and is particularly prevalent in sub-Saharan Africa. It is transmitted by female Anopheles mosquitoes infected with the malaria parasite. No vaccine against malaria is available.

1.1 Electronic Timed Mosquito Fleeting System

Electronic timed mosquito fleeting system is an alternative to other forms of mosquito control systems. The availablity of a different type of mosquito-fighting product on the market gives consumers the flexibility of choosing the repellent product that is right for them. With a variety of selections to choose from, it is important to know the benefits of each type of repellent from which you are choosing. An electronic timed fleeting system turns on the fleet at a specified time for two hours every day. This allows protection from perturbing insects, without forcing you and your children to cover you skin in strong chemicals with harsh ingredients and strong odours. It also saves time and energy since nobody needs to be around to operate it, and it can be timed to fleet the room when nobody is in the house. This electronic product will last a long time, and is a successful mosquito repellent alternative compared to conventional hand spray-on repellents.

This type of mosquito repellent is highly valuable because nobody needs to be around to spray harmful chemicals; you can time the system to work when everyone has gone to school or work. When you pursue happiness with your family and friends, you do so

because you want to spend time enjoying their company and your activities. Stinging mosquitoes can detract from this experience, leaving itching bites that scratch for days on end.

Electronic mosquito repellent offers a safe alternative to traditional repellents. It can alleviate the annoyance of being stung and the discomfort of waiting for the stings to heal. It also helps keep your family safe from West Nile virus and other communicable diseases. With your mind off the bugs and their bites, you can better enjoy your time indoors when you come back home from work.

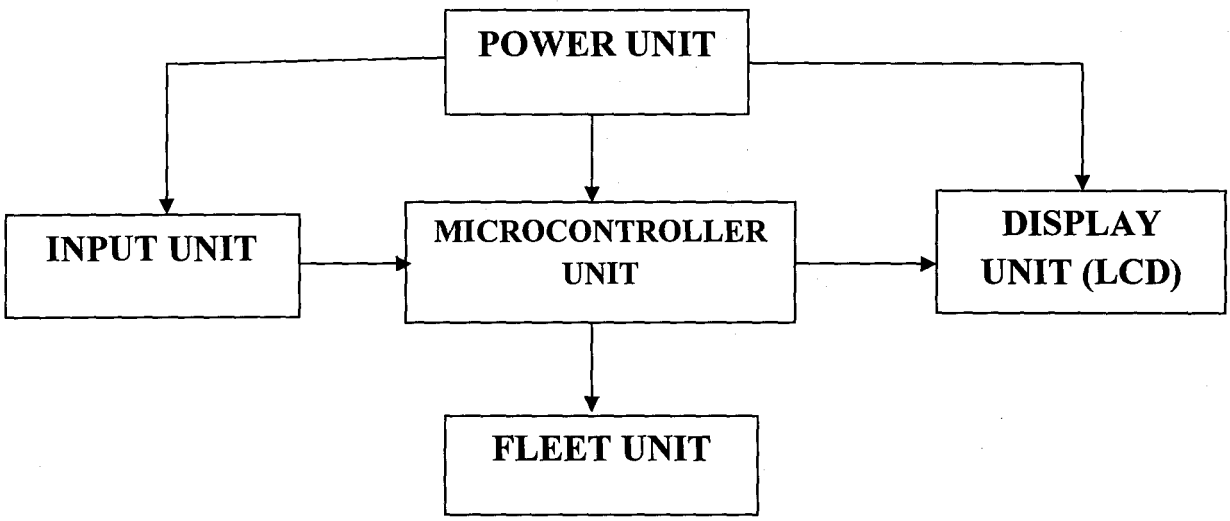

Fig. 2.1 Block diagram of Electronic timed fleet system

1.2 Project Aims and Objectives

The design and construction of an electronic timer mosquito fleet system is aimed at:

(i) Automatically spraying/fleeting a house at a specified time

(ii) Saving time and energy of house owners

(iii)Keeping the house mosquito free even when the house owner is away for a long period of time

1.3 Methodology

The construction was carried out in three stages. The first module was the construction of the power unit on the breadboard and then tested; the second module was the construction of the logic unit using the microcontroller on the breadboard and tested while the third module was the construction of the display unit using the LCD.

1.4 Scope of Work

The design and construction of electronic timer mosquito fleet system covered some areas.The system as a prototype can only be used to time how long we want to fleet the room.

1.5 Sources of Material

All the materials (components) used for the construction of this project were sourced locally from electronic vendors at the correct specifications and rating of the components.

1.6 Constraints

Several difficulties were encountered in the course of this project work. Sourcing of materials on and before the commencement of this project work was an uphill task because a lot of finance was spent on transportation to get the materials ready for construction. Also, a lot of money was spent sourcing for materials used in the write-up of this project work.

1.7 Project Outline

The report of this project consists of five chapters. The first chapter introduces the project and states the aims, objectives, motivation, scope of work and limitations. The second chapter gives the literature review and the detailed analysis of the project. The third chapter is the design and implementation stage which forms the major part of this project work; it explains the steps taken to design this project work. The fourth chapter is the testing, result and discussion which analyses the steps taken in construction of the project work and the last chapter which is the conclusion that summarizes the project work, it also contains the recommendation on how to improve on the work and followed by the references.

CHAPTER TWO

2.0 LITERATURE REVIEW/THEORETICAL BACKGROUND

The search of more comfortable and time saving ways to control mosquito by man has led researchers to develop a variety of mosquito control systems. Among these are acoustical devices, some of which have been designed as attractants and others as repellers for mosquitoes. Although acoustic attractants have evident theoretical advantages, there is not still a unanimous criterion about their effectiveness in the field. On the other hand, the alleged repellent effects of different commercial acoustic devices have not been demonstrated in research work done in the field and in laboratory conditions.

Mosquito-born diseases affect millions of people worldwide each year. The bite of a mosquito can result in anything from a skin irritation to contracting malaria. Clearly, mosquitoes are not just a nuisance, but also potentially harmful. By taking measures such as wearing long pants in wooded areas or disposing of standing water, you can minimize the chances of attracting mosquitoes. These measures, however, are often not enough, and specialty products used to combat mosquitoes are required. Each of the products used for mosquito control have varying degrees of effectiveness, and it is important to know that some may be better than others.

2.1 MosquitoNets

There are a variety of mosquito nets available in different sizes, materials and shapes. Each style of net has its advantages, and ensuring that you are using the most suitable one increases your chances of eliminating mosquitoes. It is crucial to find a net that has a mesh size large enough to allow air to circulate, but small enough to keep the mosquitoes out. Mosquito nets can be used to cover small and large areas such as your bed or your porch. Mosquito nets are an effective way to naturally combat mosquitoes.

2.2 Electric mosquito zapper

An electric zapper works by using ultraviolet light to lure in bugs and then kills them upon contact with its lethal dose of electrical charge. Unfortunately, although this is a highly successful way of killing bugs, mosquitoes are not actually attracted to ultraviolet light, and research into this method of mosquito control shows that 90% of what the electric zapper kills are actually insects that do not bite. In fact, some of the bugs that are killed are those that help us eliminate mosquitoes by eating them.

2.3 Mosquito Magnet

Like the electric mosquito zapper, the mosquito magnet is one of several mosquito traps that claim to best eliminate the pesky insects. The mosquito magnet works by releasing a carbon dioxide spray, heat and moisture that the mosquito mistakes for prey. Once the mosquito gets too close to the magnet, it is sucked in and eventually dies of dehydration. The mosquito magnet is run by a propane tank and can therefore be transported anywhere. This form of mosquito control is the most expensive of all methods and there is no conclusive scientific evidence to support its effectiveness.

2.4 Mosquito Repellent

There are a number of natural and chemical mosquito repellents that work to repel mosquitoes. The synthetic chemical repellent, DEET, is the most effective. It is essentially a poison that masks the natural odor and carbon monoxide that is released from the human body. DEET must be used with caution, especially with children. It has been known to cause dizziness and can severely irritate the skin. For these reasons, many people choose to use a natural mosquito repellent like a citronella spray. Citronella has active ingredients that repel mosquitoes and for some, the lemon smell is very appealing

CHAPTER THREE

3.0 DESIGN AND IMPLEMENTATION

3.1 Power Supply Unit

The power supply unit comprises the following

(i) Power transformer unit

(ii) Rectifier unit

(iii)Filtering unit

(iv)Power regulating unit

(v) Filtering circuit

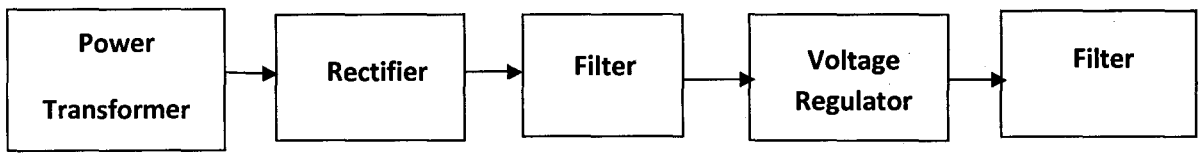

Fig 3.1 Block Diagram of Power Supply Unit

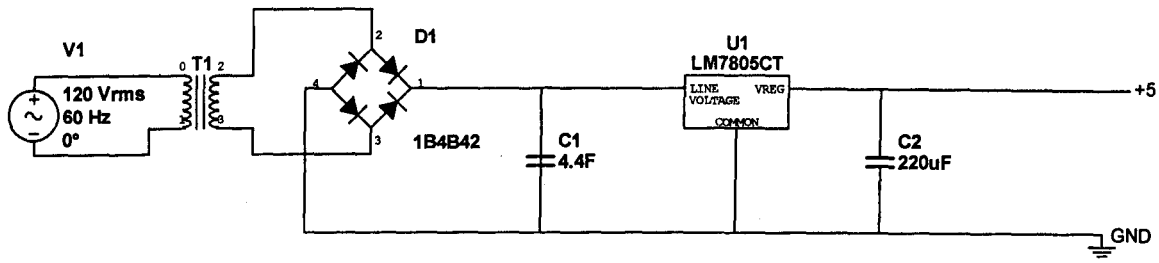

fig. 3.2 circuit diagram of power supply unit

3.1.1 Power Transformer Unit

The first block consists of the transformer. A transformer is an electronic device that steps up or steps down voltage. A 220V/24V was used. A voltage of 220V AC was stepped down to 24 AC.

3.1.1.1 Calculation

Therefore, $V_p = \sqrt{2} \times V_{rms}$ (i)

Where V_{rms} = 24V since the transformer of 220V/24V was used.

$V_p = \sqrt{2} \times 24 = 33.94V$

For safe operation, a 220V/35V transformer was chosen.

3.1.2 Rectifier Circuit

Rectification is a process of changing AC to DC. Diodes are commonly used as rectifiers in power supplies. The 24V AC stepped down from the transformer passes through the full wave bridge rectifier circuit. The rectifier circuit converts it to DC.

3.1.2.1 Calculation

After rectification, the 24 AC reduces by 1.4V. This is so because for full wave rectification two diodes conduct and two diodes block and since the forward breakdown voltage for a diode is 0.7V, the two voltages add up to give 1.4V. Thus the voltage after full wave rectification is

Voltage after rectification = 24V- (0.7 × 2) = 24- 1.4

= 22.6V DC

It is 22.6V that goes to the filtering circuit.

3.1.3 Filtering Circuit

A filter is used to reduce the amount of AC ripple, thus providing a relatively pure form of DC. The main function of the filter is to minimize the ripple content in the rectifier output. An electrolytic capacitor connected in parallel with the output of the rectifier circuit is used as a filter.

3.1.3.1 Calculation

For bridge rectifier, $V_{p(out)} = V_{p(in)} - 1.4V$, since 0.7V dropped across a diode whenever it conducts. Only two diodes will conduct at a time.

Therefore, $V_{p(out)} = 24\sqrt{2} - 1.4 = 32.54V$

dv = (30/100) * 32.54 = 9.76V

Therefore, $C = \frac{(1 * 0.01)}{9.76} = 1.034 \times 10^{-3}$ F

$C = 1034\mu F$

So the commercial value of 4400μF, 35V and 220μF, 35V was used in order to get a very flat DC since the LCD requires a flat level DC for its operation.

3.1.4 Power Regulating Circuit

A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. The entire work will comprise mainly a single microcontroller chip, a relay circuit, a LCD, all of which are low power consuming devices that require a 5V d.c voltage for optimum operation. A LM7805 voltage regulator was used to achieve a 5V output voltage. For proper operation of the LM7805 regulator, the input voltage must be at least 2V above the output voltage. Hence, a 9V transistor radio battery was utilized.

3.1.4.1 Calculation

Then the expected ripple voltage using this value of 1000μF capacitor is calculated as follows

$dv = \frac{(1 * 0.01)}{1000 \times 10^{-6}} = 10.00V$

This means that the output waveform goes from a peak value of 32.54V to (32.54-10.00)V = 22.54V. It may be noted that the input voltage to the IC regulator must be at least 2V above the output voltage. This is required in order to maintain regulation.

Therefore, peak value of 32.54V to 22.54V is acceptable since the output voltage is 5V. The ripple is neglected by the 7805 regulator.

The average voltage going to the 7805 is calculated by:

$V_p - 0.5dv = 32.54 - (0.5 \times 10.00)$

$= 27.54V$

The output from the 7805 is 5V at maximum current output of 1A. The output remains constant in spite of input voltage variation.

3.2 Design of Relay Driver Unit

The fleet device was activated by use of a relay via a transistor as the device requires A.C for its operation. The circuit arrangement is shown in the figure below.

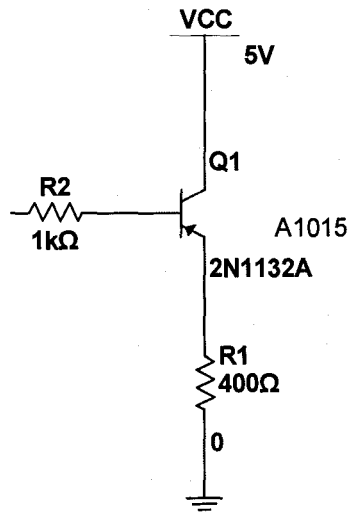

Fig. 3.3 Design of relay driver

The resistance of the relay coil is 400Ω, thus the collector current, I_c is given by;

$$I_c = \frac{5 - 0.7}{400\Omega} = \frac{4.3}{400}$$

$$= 10.73\text{mA}.$$

$$hFE = \frac{I_c}{I_B}$$

For A1015 transistor, hFE = 254

Thus, $254 = \frac{10.75}{I_B}$

$$I_B = \frac{10.75}{254}$$

$$I_B = 0.042\text{mA}$$

Thus, minimum base current to ensure saturation is 0.042mA and the maximum base resistance required is;

$$5 / 0.042\text{mA} = 118\text{k}\Omega$$

A value of 1kΩ was used to ensure saturation.

3.3 Circuit Diagram 0f the microcontroller and Lcd

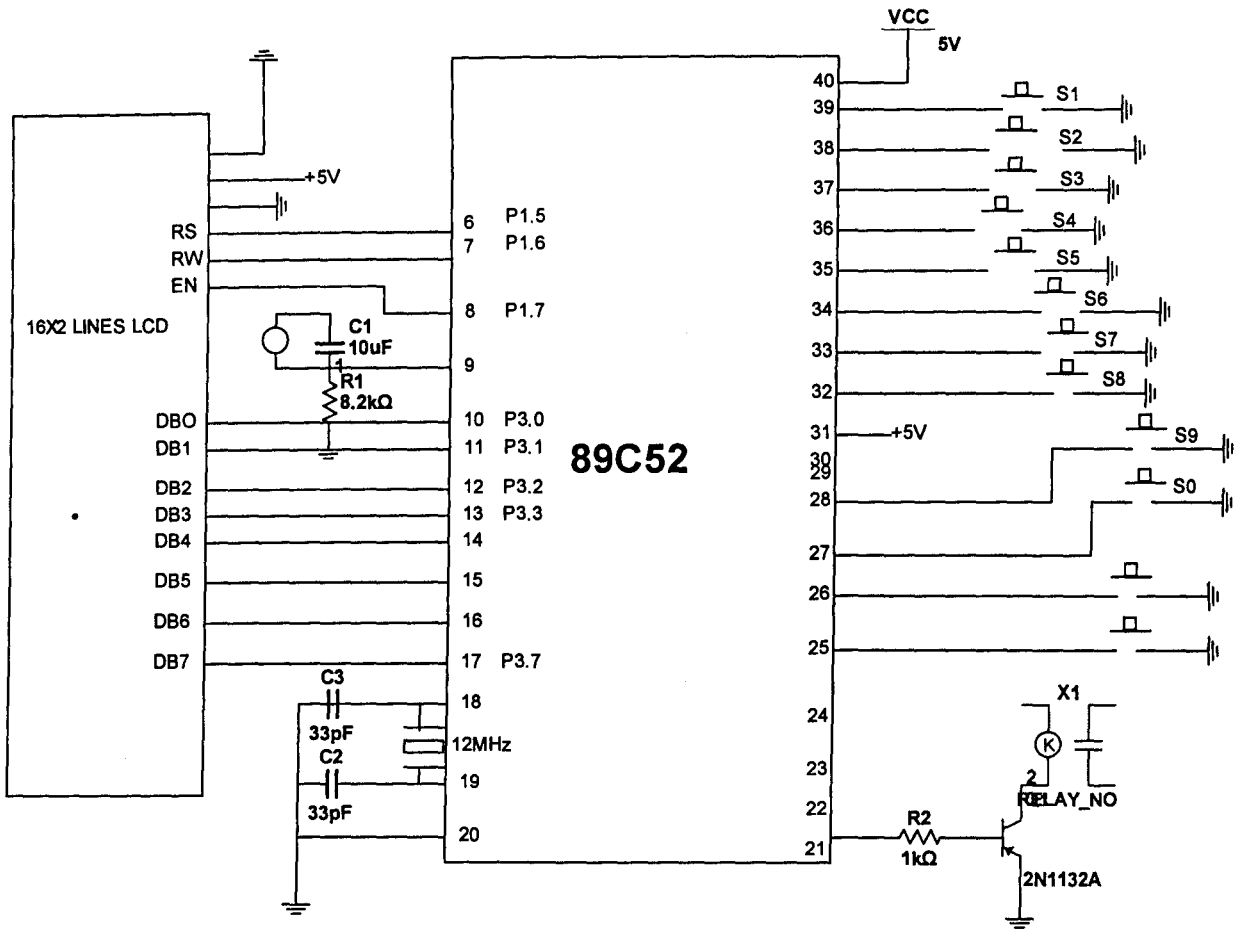

Fig 3.4 Circuit diagram showing the design and construction of an electronic timed mosquito fleeting system

CHAPTER FOUR

4.0 TESTS, RESULTS AND DISCUSSION

4.1 Tests

Each of the units of the device being constructed was simulated one after the other before being tested on bread board and then finally soldered to the Vero board.

4.2 Results

TEST	PARAMETERS	VALUES
Transformer	Input and output A.C voltage	A value of 220V at the input gave a value of 23.9V at the output.
Regulator	Input and output DC voltage	A value of 30.5V was measured at the input of the regulator and a value of 5V was given at the output
Reset Pin	Voltage level at any point in time and the level at reset	A value of 0.13V was measured at any point of normal operation and a value of 4.97V at reset time.

Table 4.1 Table of Tests, parameters and results

4.3 Discussion

The electronic timed fleeting system works with a circuit that acts like a clock, the main part of my project is the timer circuit that acts like a switch, once the user sets the time on the panel, the circuit automatically supplies power to the fleeting mechanism that fleets/sprays the room once the specified time is reached. The circuit is left on for a while then it goes off and waits for the next time it has to come on.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The target of this project which is the design and construction of an electronic timer mosquito fleet system was achieved as demonstrated by the results obtained from the tests carried out as explained in chapter four

The aim which was to use an electronic timer mosquito fleet system rather than the conventional use of hand to operate the mosquito fleet was achieved. This is an improvement in the control of mosquitoes and malaria, and also the fleeting of the room is now automated thereby saving time and energy.

Though a number of difficulties were encountered at the design and construction stage of this project, consultation and constant research helped to get through

5.2 Recommendation

i. The system can be made to detect mosquitoes from the sounds they make, and automatically fleet the room once the mosquito noise reaches a certain level

ii. The system can be made to sense human presence and pause the spraying of the house till nobody is around.

iii. An inverter can be incoporated into the system incase of power failure, since the circuit needs to be constantly connected to a power source.

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APPENDIX I

```
ORG 0000H
   CLR A
   MOV R0,#00H
   MOV R1,#00H
   MOV R2,#00H
   MOV R3,#00H
   MOV R4,#00H
   MOV R5,#00H
   MOV R6,#00H
   MOV R7,#00H
DB0 EQU P3.0
DB1 EQU P3.1
DB2 EQU P3.2
DB3 EQU P3.3
DB4 EQU P3.4
DB5 EQU P3.5
DB6 EQU P3.6
DB7 EQU P3.7
DATA EQU P3
RS EQU P1.2
RW EQU P1.3
EN EQU P1.4
UP EQU P1.1
DOWN EQU P1.0
```

```
        MOV DATA,#38H
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        CLR RS
        MOV DATA,#0FH
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        CLR RS
        MOV DATA,#06H
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        RET
OVERPOYNT:CLR RS
      MOV DATA,#83H
      SETB EN
      CLR EN
      LCALL WAIT_LCD
      RET
FLEET:MOV R2,#10
      CLR P2.0
 HUYY:LCALL OJAY
      DEC R2
      CJNE  R2,#0,HUYY
```

```
        SETB P2.0
        RET
POYNT:LCALL VEENITA
        MOV A,#' '
        LCALL WRITE_TEXT
        MOV A,#' '
        LCALL WRITE_TEXT
        MOV A,#58
        LCALL WRITE_TEXT
        CLR RS
        MOV DATA,#8EH
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        MOV A,#'A'
        LCALL WRITE_TEXT
        MOV A,#'M'
        LCALL WRITE_TEXT
        CLR RS
        MOV DATA,#0CEH
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        MOV A,#'P'
        LCALL WRITE_TEXT
        MOV A,#'M'
```

```
        LCALL WRITE_TEXT
        CLR RS
        MOV DATA,#80H
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        RET
INITLCD:CLR RS
          MOV DATA,#38H
          SETB EN
          CLR EN
          LCALL WAIT_LCD
          CLR RS
          MOV DATA,#0EH
          SETB EN
          CLR EN
          LCALL WAIT_LCD
          CLR RS
          MOV DATA,#06H
          SETB EN
          CLR EN
          LCALL WAIT_LCD
          RET
CLR_LCD:CLR RS
          MOV DATA,#01H
          SETB EN
```

```
          CLR EN
          LCALL WAIT_LCD
          RET
WAIT_LCD:CLR EN
          CLR RS
          SETB RW
          MOV DATA,#0FFH
          SETB EN
          MOV A, DATA
          INC R3
          CJNE R3,#255,RAYZOR
          SJMP OZIL
RAYZOR:   JB ACC.7,WAIT_LCD
          CLR EN
          CLR RW
OZIL:     MOV R3,#00H
          RET
WRITE_TEXT:SETB RS
            MOV DATA,A
            SETB EN
            CLR EN
            LCALL WAIT_LCD
            RET

NEXT_LINE:CLR RS
          MOV DATA,#0C0H
```

```
        SETB EN
        CLR EN
        LCALL WAIT_LCD
        RET
OJANE:MOV R2,#60
UIT:LCALL OJAY
    DEC R2
    CJNE R2,#0,UIT
    RET

OJAY:LCALL OJ
     INC R0
     CJNE R0,#14H, OJAY
     MOV R0,#00H
     RET
OJ:MOV TMOD,#01
   MOV TL0,#0H
   MOV TH0,#3CH
   SETB TR0
   JNB TF0,$
   CLR TF0
   CLR TR0
   RET
VEENITA:LCALL INIT_LCD
        LCALL CLR_LCD
        RET
```

```
VEENA:LCALL INITLCD
        LCALL CLR_LCD
        RET
UMAR: JNB P2.6,TENOJ
     JNB P0.0,ONEOJ
     JNB P1.5,UMAR
     JNB P0.1,TWOOJ
     JNB P0.2,THROJ
     JNB P0.3,FOUOJ
     JNB P0.4,FIVOJ
     JNB P1.6,UMAR
     JNB P0.5,SIXOJ
     JNB P0.6,SEVOJ
     JNB P0.7,EIGOJ
     JNB P2.7,NINOJ

     SJMP UMAR
ONEOJ:JNB P0.0,$
      SJMP ONE
TWOOJ:JNB P0.1,$
      SJMP TWO
THROJ:JNB P0.2,$
      SJMP THR
FOUOJ:JNB P0.3,$
      SJMP FOU
FIVOJ:JNB P0.4,$
```

```
       SJMP FIV
SIXOJ:JNB P0.5,$
       SJMP SIX
SEVOJ:JNB P0.6,$
       SJMP SEV
EIGOJ:JNB P0.7,$
       SJMP EIG
NINOJ:JNB P2.7,$
       SJMP NIN
TENOJ:JNB P2.6,$
       SJMP TEN
ONE:MOV A,#'1'
    MOV R1,#1
SJMP ESS
TWO:MOV A,#'2'
    MOV R1,#2
SJMP ESS
THR:MOV A,#'3'
    MOV R1,#3
SJMP ESS
FOU:MOV A,#'4'
    MOV R1,#4
SJMP ESS
FIV:MOV A,#'5'
    MOV R1,#5
SJMP ESS
```

```
SIX:MOV A,#'6'
    MOV R1,#6
SJMP ESS
SEV:MOV A,#'7'
    MOV R1,#7
SJMP ESS
EIG:MOV A,#'8'
    MOV R1,#8
SJMP ESS
NIN:MOV A,#'9'
    MOV R1,#9
SJMP ESS
TEN:MOV A,#'0'
    MOV R1,#0
ESS:LCALL OJ
    LCALL WRITE_TEXT
    RET

UMARU:CJNE A,#1,TOOO
      MOV A,#'1'
      SJMP DEAR
TOOO:CJNE A,#2,TERE
     MOV A,#'2'
     SJMP DEAR
TERE:CJNE A,#3,FOUUR
     MOV A,#'3'
```

```
      SJMP DEAR
FOUUR:CJNE A,#4,FAIVE
       MOV A,#'4'
       SJMP DEAR
FAIVE:CJNE A,#5,SEX
      MOV A,#'5'
      SJMP DEAR
SEX:CJNE A,#6,SAVEN
      MOV A,#'6'
      SJMP DEAR
SAVEN:CJNE A,#7,EITE
      MOV A,#'7'
      SJMP DEAR
EITE:CJNE A,#8,NAINE
      MOV A,#'8'
      SJMP DEAR
NAINE:CJNE A,#9,TAEN
      MOV A,#'9'
      SJMP DEAR
TAEN:MOV A,#'0'
DEAR:LCALL WRITE_TEXT
      RET

WRITER:LCALL VEENA
        MOV A,R6
        MOV B,#10
```

```
        DIV AB
        LCALL UMARU
        MOV A,B
        LCALL UMARU
        MOV A,#58
        LCALL WRITE_TEXT
        MOV A,R7
        MOV B,#10
        DIV AB
        LCALL UMARU
        MOV A,B
        LCALL UMARU
        JB P2.3,FAISAL
        CLR RS
      MOV DATA,#8EH
      SETB EN
      CLR EN
      LCALL WAIT_LCD
      MOV A,#'A'
      LCALL WRITE_TEXT
      MOV A,#'M'
      LCALL WRITE_TEXT
      RET
FAISAL:CLR RS
      MOV DATA,#8EH
      SETB EN
```

```
        CLR EN
        LCALL WAIT_LCD
        MOV A,#'P'
        LCALL WRITE_TEXT
        MOV A,#'M'
        LCALL WRITE_TEXT
        RET

HELLO:LCALL VEENA
        MOV A,#'H'
        LCALL WRITE_TEXT
        MOV A,#'E'
        LCALL WRITE_TEXT
        MOV A,#'L'
        LCALL WRITE_TEXT
        MOV A,#'L'
        LCALL WRITE_TEXT
        MOV A,#'O'
        LCALL WRITE_TEXT
        MOV A,#' '
        LCALL WRITE_TEXT
        MOV A,#'T'
        LCALL WRITE_TEXT
        MOV A,#'U'
        LCALL WRITE_TEXT
        MOV A,#'J'
```

```
        LCALL WRITE_TEXT
        MOV A,#'O'
        LCALL WRITE_TEXT
        RET

ENTFT:LCALL VEENITA
        MOV A,#'E'
        LCALL WRITE_TEXT
        MOV A,#'N'
        LCALL WRITE_TEXT
        MOV A,#'T'
        LCALL WRITE_TEXT
        MOV A,#'E'
        LCALL WRITE_TEXT
        MOV A,#'R'
        LCALL WRITE_TEXT
        MOV A,#' '
        LCALL WRITE_TEXT
        MOV A,#'F'
        LCALL WRITE_TEXT
        MOV A,#'L'
        LCALL WRITE_TEXT
        MOV A,#'E'
        LCALL WRITE_TEXT
        MOV A,#'E'
        LCALL WRITE_TEXT
```

```
MOV A,#'T'
LCALL WRITE_TEXT
MOV A,#' '
LCALL WRITE_TEXT
MOV A,#'T'
LCALL WRITE_TEXT
MOV A,#'I'
LCALL WRITE_TEXT
MOV A,#'M'
LCALL WRITE_TEXT
MOV A,#'E'
LCALL WRITE_TEXT
LCALL NEXT_LINE
MOV A,#'I'
LCALL WRITE_TEXT
MOV A,#'N'
LCALL WRITE_TEXT
LCALL IMPRESS
MOV A,#'5'
LCALL WRITE_TEXT
LCALL OJAY
LCALL IMPRESS
MOV A,#'4'
LCALL WRITE_TEXT
LCALL OJAY
LCALL IMPRESS
```

```
        MOV A,#'3'
        LCALL WRITE_TEXT
        LCALL OJAY
        LCALL IMPRESS
        MOV A,#'2'
        LCALL WRITE_TEXT
        LCALL OJAY
        LCALL IMPRESS
        MOV A,#'1'
        LCALL WRITE_TEXT
        LCALL OJAY
        RET
IMPRESS: CLR RS
          MOV DATA,#0C3H
          SETB EN
          CLR EN
          LCALL WAIT_LCD
          RET

ENTPT:LCALL VEENA
      MOV A,#'E'
      LCALL WRITE_TEXT
      MOV A,#'N'
      LCALL WRITE_TEXT
      MOV A,#'T'
      LCALL WRITE_TEXT
```

```
MOV A,#'E'
LCALL WRITE_TEXT
MOV A,#'R'
LCALL WRITE_TEXT
MOV A,#' '
LCALL WRITE_TEXT
MOV A,#'P'
LCALL WRITE_TEXT
MOV A,#'R'
LCALL WRITE_TEXT
MOV A,#'E'
LCALL WRITE_TEXT
MOV A,#'S'
LCALL WRITE_TEXT
MOV A,#'E'
LCALL WRITE_TEXT
MOV A,#'N'
LCALL WRITE_TEXT
MOV A,#'T'
LCALL WRITE_TEXT
LCALL NEXT_LINE
MOV A,#'T'
LCALL WRITE_TEXT
MOV A,#'I'
LCALL WRITE_TEXT
MOV A,#'M'
```

```
LCALL WRITE_TEXT
MOV A,#'E'
LCALL WRITE_TEXT
MOV A,#' '
LCALL WRITE_TEXT
MOV A,#'I'
LCALL WRITE_TEXT
MOV A,#'N'
LCALL WRITE_TEXT
LCALL IMPRESSE
MOV A,#'5'
LCALL WRITE_TEXT
LCALL OJAY
LCALL IMPRESSE
MOV A,#'4'
LCALL WRITE_TEXT
LCALL OJAY
LCALL IMPRESSE
MOV A,#'3'
LCALL WRITE_TEXT
LCALL OJAY
LCALL IMPRESSE
MOV A,#'2'
LCALL WRITE_TEXT
LCALL OJAY
LCALL IMPRESSE
```

```
      MOV A,#'1'
      LCALL WRITE_TEXT
      LCALL OJAY
      RET
IMPRESSE: CLR RS
         MOV DATA,#0C8H
         SETB EN
         CLR EN
         LCALL WAIT_LCD
         RET
CT:LCALL OJAY
   LCALL OJAY
   LCALL HELLO
   LCALL OJAY
   LCALL OJAY
   LCALL OJAY
   LCALL OJAY
   LCALL OJAY
LCALL ENTFT
LCALL POYNT
CLR P1.5
LCALL UMAR
SETB P1.5
MOV A,R1
MOV R2,A
LCALL UMAR
```

```
 MOV A,R2
 MOV B,#10
 MUL AB
 ADD A,R1
 MOV R4,A
 LCALL OVERPOYNT
 CLR P1.6
 LCALL UMAR
 SETB P1.6
 MOV A,R1
 MOV R2,A
 LCALL UMAR
 MOV A,R2
 MOV B,#10
 MUL AB
 ADD A,R1
 MOV R5,A
 AMPM:JNB UP,AM
      JNB DOWN,PM
      SJMP AMPM
AM:JNB UP,$
   CLR P2.2
   SJMP OIT
   LCALL OJ
PM:JNB DOWN,$
   LCALL OJ
```

```
OIT:LCALL ENTPT
    LCALL POYNT
    CLR P1.5
    LCALL UMAR
    SETB P1.5
MOV A,R1
MOV R2,A
LCALL UMAR
MOV A,R2
MOV B,#10
MUL AB
ADD A,R1
MOV R6,A
LCALL OVERPOYNT
     CLR P1.6
LCALL UMAR
     SETB P1.6
MOV A,R1
MOV R2,A
LCALL UMAR
MOV A,R2
MOV B,#10
MUL AB
ADD A,R1
MOV R7,A
AMEPM:JNB UP,AME
```

```
        JNB DOWN,PME
        SJMP AMEPM
AME:JNB UP,$
    LCALL OJ
    CLR P2.3
    SJMP OITE
PME:JNB DOWN,$
    LCALL OJ
OITE:LCALL WRITER
     LCALL OJANE
     INC R7
     MOV DPH,R4
     MOV DPL,R5
     MOV A,R6
     CJNE A,DPH,LIU
     MOV A,R7
     CJNE A,DPL,LIU
BYC:JB P2.2,MIU
    JNB P2.3,TAIE
    SJMP LIU
MIU: JNB P2.3,LIU
TAIE:LCALL FLEET

LIU:CJNE R7,#60,OITE
    MOV R7,#00
    CJNE R6,#12,FAISA
```

```
      MOV R6,#00
      CPL P2.3
FAISA:INC R6
      LJMP OITE
```