Lab Name: ECE 3004 Microprocessor and Microcontroller

Expt No: 1(a)

Date : 17-11-2023

ACM: Addition of two 32 bit Numbers.

Sample Input: AX = 70601523H, BH

Sample Output: 07200H = 147123553H.

Registration no: 21BCE10381

Full signature: Akshay Choudhary

Memory Location	Hex Codes	Mnemonics.
0000H	75 40 23	MOV 40H, #23
0003H	75 41 15	MOV 41H, #15
0006H	75 42 60	MOV 42H, #60
0009H	75 43 70	MOV 43H, #70
000CH	75 50 30	MOV 50H, #30
000FH	75 51 40	MOV 51H, #40
0012H	75 52 63	MOV 52H, #63
0015H	75 53 77	MOV 53H, #77
0018H	F5 40	MOV R0, #40H
001AH	F5 60	MOV R1, #60H
001CH	F5 04	MOV R2, #04H
001EH	D2 98	SET B R50
0020H	F5 50	MOV R1, #50H.
0022H	C2 98	CLR R50
0024H	C2 97	CLR C

0026H	E540	MOV A, @R0
0028H	D298	SETB R50
002AH	3550	~~INC~~ ADDC A, @R1
002CH	0550	INC R1
002EH	C298	CLR R50
0030H	F560	MOV @R1, A
0032H	0540	INC R0
0034H	0560	INC R1
0036H	D504	DJNZ R2, REPEAT
0038H	5006	INC EXIT
003AH	0560	INC @R1
003CH	00	EXIT: NOP
003DH	80FE	SJMP $
003FH		END.

21BCE10381
ANSHAY
CHAUDHARY

Code:

```
MOV AX, first_number
MOV DX, second_number
~~Addd~~
ADD AX, BX.
ADD DX, CX
```

Lab Name: Ec.E. 3004 Microprocessor and Microcontroller.

Expt No: 1.(1)

Date: 17-12-2023.

AIM: Multiply (-09H) with (+02H)

Sample Input: A = -09H, B = +02H.

Sample output: 0720 0H = -18

21BCE

Registration No - 21BCE10881

Full Signature: Akshay Chaudhary.

Memory location	Hex code	Mnemonics.
0000H	75 F0 40	MOV R0, H 40H
0003H	E500	MOV A, @R0
0005H	08	INC R0
0006H	E500	MOV B, @ R0
0008H	A4	MUL AB
0009H	08	INC R0
000AH	F500	MOV @R0, A
000CH	08	INC R0
000DH	F500	MOV @ R0, B
000FH		END.

Code:

```
MOV AL, -09H
MOV BL, 02H
IMUL BL
```

Lab Name: ECE3004 Microprocessor and Microcontroller

Expt No 1 (d)

Date 17-12-2023.

Aim Divide 0034H with 07H

Sample Input A=0034H, B=07H

Sample Output a=07, b=03.

Registration No: 21BCE10381
Full Signature - Akshay Choudhary.

Memory location	Hexcode	Mnemonics
0000H	7434	MOV A, #34H
0002H	75F007	MOV B, #07H.
0005H	84	DIV AB
0006H		END

Code

```
MOV AX, 0034H
MOV BH, 07H
IDIV BH.
```

Lab Name: ECE3004 Microprocessor and Microcontroller
Expt No 2
Date 17-12-2023
Aim Array sorting: arrange 5 data bytes in ascending order.
Sample Input. 010, 004, 002, 001, 006.
Sample Output 001, 002, 004, 006, 010

Registration No: 21BCE1038
Full Signature: AKSHAY CHAUDHARY

Memory Location	Hex code.	Mnemonics.
0000H.	75 f4 04	MOV R4, #04H
0003H	75 f3 04	MOV R3, #04H. ~~MOV A @R0 #04H~~
0006H	75 f0 30	MOV R0, #30H
0009H	E500	MOV A, @R0
000BH	F5F0	MOV A, B.
000DH	08	INC R0
000EH	E500	MOV A, @R0
0010H	BF00.	CINE A, B
0012H		JNC SKIP
0012H	F500	MOV @R0, B.
0014H	18	INC R0
0015H	F500	DJNZ R4, AGAIN.
0017H	08	STOP: SJMP STOP
0018H	DFF4	~~END~~ . INC R0 .
001AH	80FE	JNC SKIP
001CH		~~END~~ END

Date
DELTA Pg No.

Lab Name: ELE 3004 Microprocessor and Microcontroller.

Expt No: 4

Date : 17-12-23

Aim: Block data transfer [a block of 12 data types].

Sample Input: 0A, 0C, 17, 2D, 41, 40, 59, 2D, 41, 28, 16, 29]

Sample Output: 0A, 0C, 17, 2D, 41, 40, 59, 4D, 41, 28, 1629.

Registration No : 21BCE1031

Full Signature: AKSHAY CHAUDHARY.

Memory location	Hexcode	Mnemonics
0000H	75 F0 30	MOV R_0, #30H
0003H	75 F_1 40	MOV R_1, #40H
0006H	75 F_2 10	MOV R_2, #10H
0009H	E500	MOV A, @ R_0
000BH	F501	MOV @ R_1, A
000DH	08	INC R_0
000EH	09	INC R_1
000FH	DF F2	DJNZ R_2, REPEAT.

Code:

```
MAINPROC.
    MOV AX, @DATA
    MOV DS, AX
    LEA SI, Source_block.
    LEA DI, dest_block.
    MOV CX, 12
    CLD

REP MOVSB.
MOV AH, 4CH
INT 21H
```

8051 Microcontroller.

Date
DELTA Pg No

Lab Name: ECE 3004 Microprocessor and Microcontroller

Expt. No.: 5

Date: 17-12-23

Aim: Delay calculation and generation of square wave at Port P1.0 with 1kHz f.

Name Registration No: 21BCE10381
Full signature

Code:-

```
Start: Set P1.0
       LCALL DELAY
       CLR P1.0
       LCALL DELAY
       SJMP START.
DELAY: MOV R3, #FJH
L1     DJNJ R3, L1
       RET
END :
```

Date
DELTA Pg No.

Qb Lab Name : ECE 3004 MP MC

Expt No: 06

DATE : 17-12-2023

Aim : Assume two to LED connected to $P_{1.0}$ $P_{1.1}$. Write a program to blink two LED with a delay 0.5 ms

Reg.No:21BCE10381

Full Signature : AKSHAY CHOUDHARY

Code : ~~0x00~~

```
org 0x000.
MAIN: MOV P1,#6X01
      CALL DELAY
      MOV P1, #0X00
      CALL DELAY
      MOV P1, #0X02
      CALL DELAY
      MOV P1, #0X00
      CALL DELAY
      SJMP MAIN

DELAY:
      MOV R2,#0X0A

Outer Loop:
      MOV R1, #0xFF

INNER LOOP:
      NOP
      DJNZ R1, INNER_LOOP
      DJNZ R2, OUTER_LOOP
      RET
END
```

Date
DELTA Pg No.

LAB NAME : ECE 3004 MPMC

Expt No : 7

Date 17-12-2023

Aim Delay calculation and generation for square wave at Port 1.0 with 1 kHz using timer.

Reg No : 21BCE10381

Full Signature : Akshay Choudhary

Code:-

```
org: 0x00
MOV TMOD  #01h
MOV TH0   #63CH
MOV TL0   #0xBQ
SET TR0

MAIN:
    JNB TF0, MAIN
    CLP P1.0
    CLR TF0
    SJMP MAIN

END:
```

Q8) LABNAME: ECE3004 MPMC

LAB No: 08

Date: 17-12-2023

Aim: Interfacing LCD Display.

Reg NO: 21BCE10381

Full Signature: ARSHAY CHOUDHARY

Theory:

8051 typically involves sending commands and data through the MC I/O ports to control the display

Assembly Code:

```
ORG: 0x00
MOV DPTR, #LCD_int
CALL LCD_command
MOV DPTR, #
CALL LCD_Message
MLT; Halt the processor.
LCD_init: ; LCD initialization routine.
MOV A, #0x38 ;
CALL LCD_command Delay.
MOV A, #0x0E;
CALL LCD_command_Delay.
MOV A, #0x06;
CALL LCD_command_Delay
MOV A, #0x01;
CALL LCD_command_Delay
RET
```

Reg No : 21BCE10381
Full Signature : AYUSHAY CHOUDHARY

```
LCD_Command_Display;
    MOV R2, #50
  Delay_C1:
     DJN2 R2, Delay_C1
     RET.
LCD_ Message.;
  A MOV R0, #0;
  Message_Loop:
     MOV A, Message [R0];
     INC R0;
     JZ Message_END;
     CALL LCD_Delay;
     CALL LCD_Data;
     JMP Message_Loop;
   Message_End:
     RET.
LCD_Command:
     MOV P1, A;
     CLR RS; RS = 0 for command
     RW.
     CLR RW;
     CLR RW;
     SET EN;
     CLR EN;
     RET:
```

OUTPUT :→ DB "Hello, LCD!", 0; Null terminated String

Q9 LabNAME : ECE 3004 MPMC

Lab NO : 09

Date : 17-12-2023

Aim : Interfacing with Keypad

Reg No : 21BCE10381

Full Signature : ANSHAY CHOUDHARY

Theory : to Interface we read the key presses from the keypad and perform action based on pressed keys.

Code :

```
ORG 0x00
MOV DPTR, # Keypad_Init
CALL Keypad_Command.

MOV DPTR
  MAIN_LOOP:
    CALL Read_Keypad
    JZ MAIN_LOOP;

    MOV A, P3;
    CALL Display_Key.

    JMP MAIN_Loop;
    HLT;

Keypad_Init:;
MOV P2, #0xF0;
RET
```

```
Read_Keypad:;
    MOV A, #0xFF;
    Mov P2;# 0x0F;
    No P;
    MOV A, P2;
      CPL A;
      MOV R1, A;
    MOV P2, #0x f0;
    No P;

  · MOV A, R2;
    ORL A, R1;
    RET

Display_Key:;
    MOV P1, A;
    CALL Delay
    CLR P1;
    RET
Delay:;
      MOV R2, #50
Delay_Loop:
    DJN2 R2, Delay_Loop
    RET.
ORG 0x30

Main Loop:
    JMP MainLoop
```

Q10 Lab NAME : ECE3004 MPMC

Lab No : 10

Date 17-12-2023

Aim: Programming ADC.

Reg No: 21BCE10381

Full Signature: AKSHAY CHOUDHARY

Theory:- It involves conversion of analog signals using the ADC and generating analog signals using the DAC.

Code:

```
ORG 0x00
MOV DPTR, #ADC-Init
LCALL ADC-Command.

MAIN-LOOP:
 CALL ADC-Read;
 CALL DAC-Read;
 JMP MAIN-LOOP;
 HLT;

ADC-Init;
 MOV P1, #0xFF
 RET.

ADC-Read;
 MOV P1, #0,FF;
 MOV A, P1;
```

```
MOV P1, A;
RET

DAC_write:;
MOV P3, A;
CALL Delay;
RET.

Delay:.;
MOV R2, #50

Delay_Loop:
DJNZ R2, Delay_Loop
RET

ORG 0x30.
```

Q11

LAB NAME : 23ECE2004MPMC

Lab No : 11

Date : 17-12-2003

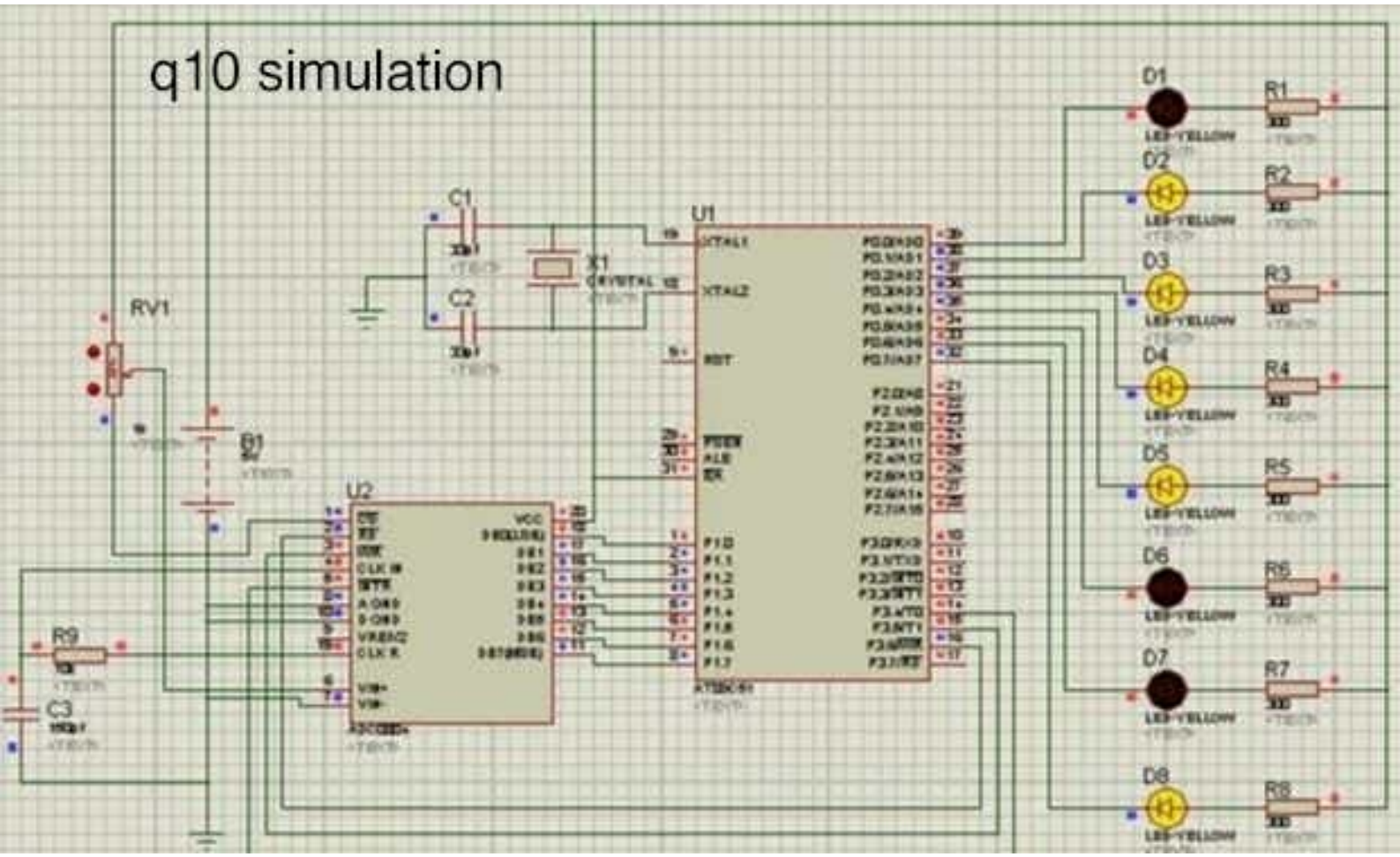
Aim : Interfering with stepper motor.

Reg No: 21BCE10381

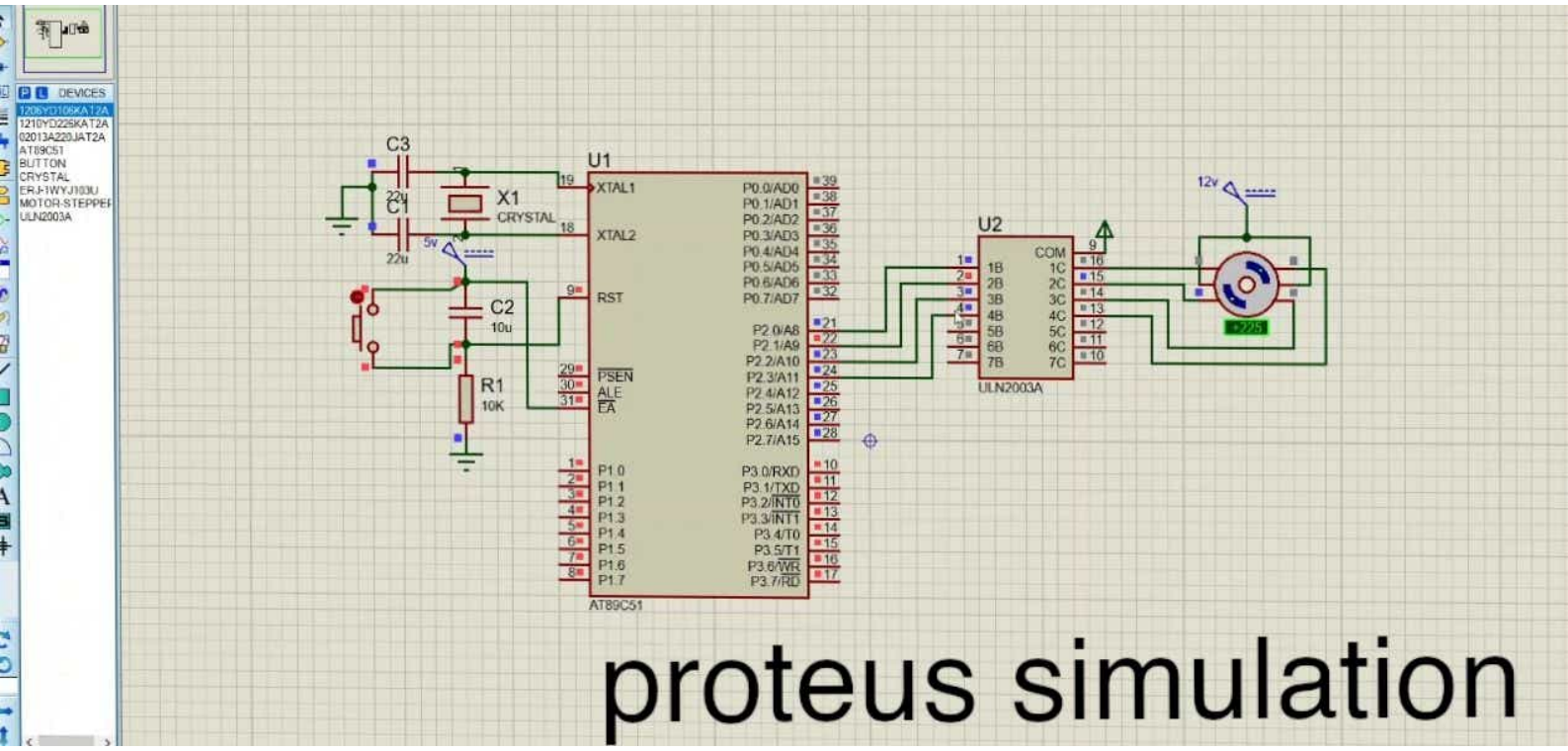
Full Signature: AKSHAY CHOUDHARY

Code:

```
ORG 0x00
MOV DPTR, #stepper_Init
CALL Stepper_command

MAIN_LOOP:
  MOV A, #0x01;
  CALL stepper-MOVE
  CALL Delay.

  MOV A, #0x02;
   CALL stepper-MOVE
   CALL Delay.

  MOV A, #0x03;
  CALL Stepper_MOVE
  CALL Delay.

MOV A, #0x04;
CALL Stepper_MOVE
CALL Delay

JMP MAIN_LOOP;
HLT;
```


q10 simulation
U1
U2
C1
C2
C3
X1
RV1
B1
R9
D1
D2
D3
D4
D5
D6
D7
D8
R1
R2
R3
R4
R5
R6
R7
R8

```
Stepper_Init:;
    MOV P1, #0x00;
    MOV P2, #0x00;

Stepper_Move:;
    MOV P2, A;
    CALL Delay;
    RET

Delay:;
    MOV R2, #50

Delay_LOOP:
    DJNZ R2; Delay_LOOP.
    RET.
ORG 0x30.
```


DEVICES
1206YD106KAT2A
1210YD225KAT2A
02013A220JAT2A
AT89C51
BUTTON
CRYSTAL
ERJ-1WYJ103U
MOTOR-STEPPER
ULN2003A
C3
22u
C1
22u
X1
CRYSTAL
5v
C2
10u
R1
10K
U1
XTAL1
XTAL2
RST
PSEN
ALE
EA
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
P0.0/AD0
P0.1/AD1
P0.2/AD2
P0.3/AD3
P0.4/AD4
P0.5/AD5
P0.6/AD6
P0.7/AD7
P2.0/A8
P2.1/A9
P2.2/A10
P2.3/A11
P2.4/A12
P2.5/A13
P2.6/A14
P2.7/A15
P3.0/RXD
P3.1/TXD
P3.2/INT0
P3.3/INT1
P3.4/T0
P3.5/T1
P3.6/WR
P3.7/RD
AT89C51
U2
1B
2B
3B
4B
5B
6B
7B
COM
1C
2C
3C
4C
5C
6C
7C
ULN2003A
12v
proteus simulation