MICROPROCESSOR LAB (10ECL68)

I) **Programs involving**

1) **Data transfer instructions like**:
   i] Byte and Word data transfer in different addressing modes.
   ii] Block move (with and without overlap)
   iii] Block interchange

2) **Arithmetic & Logical operations like**:
   i] Addition and Subtraction of multi-precision nos.
   ii] Multiplication and Division of signed and unsigned Hexadecimal nos.
   iii] ASCII adjustment instructions
   iv] Code conversions
   v] Arithmetic programs to find square cube, LCM, GCD, factorial

3) **Bit manipulation instructions like checking**:
   i] Whether given data is positive or negative
   ii] Whether given data is odd or even
   iii] Logical 1's and 0's in a given data
   iv] 2 out 5 code
   v] Bit wise and nibble-wise palindrome

4) **Branch/Loop instructions like**:
   i] Arrays: addition/subtraction of N nos., Finding largest and smallest nos., Ascending and descending order
   ii] Near and Far Conditional and Unconditional jumps, Calls and Returns

5) Programs on **String manipulation** like string transfer, string reversing, searching for a string, etc.

6) **Programs involving Software interrupts**
   Programs to use DOS interrupt INT 21h Function calls for Reading a Character from keyboard, Buffered Keyboard input, Display of Character/ String on console

II) **Experiments on interfacing 8086 with the following interfacing modules** through **DIO (Digital Input/Output-PCI bus compatible) card**

a) Matrix keyboard interfacing
b) Seven segment display interface
c) Logical controller interface
d) Stepper motor interface

III) **Other Interfacing Programs**
a) Interfacing a printer to an X86 microcomputer
b) PC to PC Communication

LESSON PLAN

NAME OF THE FACULTY: SOWMYA R BANGARI

SUBJECT: MICROPROCESSOR LAB (10ECL68)

SEMESTER: VI SEM 'B'

COURSE OUTCOME

1. Write an assembly level program for different addressing modes
2. Write an assembly program for code conversion
3. Implement an assembly level code for branch, loop and subroutine
4. Write an assembly level code for string operations
5. Write an assembly level code to interface I/O devices- Keypad, LED display, Printer
6. Write an assembly level code to control the speed and direction of the stepper motor.

SL. 0NO.	DATE	TIME	EXPERIMENT TITLE	CO	Expt
1	09-02-16 10-02-16 11-02-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Data transfer in different addressing ii. Block move (with & without overlap) iii. Block interchange iv. Addition & Subtraction	1	1
2	16-02-16 17-02-16 18-02-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Multiplication & Division of \hexadecimal nos. ii. Square, cube of a no.	1	2
3	23-02-16 24-02-16 25-02-16	01.45-04.45 09.00-12.00 01.45-04.45	i. LCM ii. GCD iii. Factorial	3	3
4	01-03-16 02-03-16 03-03-16	01.45-04.45 09.00-12.00 01.45-04.45	I ASCII adjustment iv. Code conversion v. 2 out of 5 code	2	4

5	08-03-16 09-03-16 10-03-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Check the data is positive & negative ii. Odd & Even iii. Logical 1's & 0's in a given data	3	5
6	22-03-16 23-03-16 17-03-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Palindrome	3	6
7	29-03-16 30-03-16 24-03-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Addition & subtraction of N nos ii. Largest & Smallest nos in an array	3	7
8	05-04-16 06-04-16 07-04-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Ascending & Descending order	3	8
9	12-04-16 13-04-16 21-04-16	01.45-04.45 09.00-12.00 01.45-04.45	i. String manipulation, ECHO	4	9
10	26-04-16 20-04-16 21-04-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Keyboard interface ii. Seven segment display	5	10
11	03-05-16 27-04-16 28-04-16	01.45-04.45 09.00-12.00 01.45-04.45	i. Logical Controller Display Ii Printer interface Iii PC to PC communication	5	11
12	10-05-16 04-05-16 05-05-16	01.45-04.45 09.00-12.00 01.45-04.45	Stepper Motor Interface	6	12
13	Extra class 11-05-16 12-05-16	01.45-04.45 09.00-12.00 01.45-04.45	Demo of elevator (Beyond the syllabus)		

14	Extra class Extra class 19-05-16	01.45-04.45 09.00-12.00 01.45-04.45	Lab Internals		

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LESSON PLAN

NAME OF THE FACULTY: SOWMYA R BANGARI

SUBJECT: MICROPROCESSOR (10EC62)

SEMESTER: VI SEM 'B'

SL. NO.	DATE	TIME	CH. NO.	CHAPTER TITLE	Remarks
					L
			1	**8086 Processors**	
1	01-02-16	09.00-10.00		Introduction, historical background	√
2	01-02-16	03.45-04.45		8086 architecture	√
3	02-02-16	10.00-11.00		8086 architecture contd.	√
4	05-02-16	09.00-10.00		Machine language instructions, Instruction execution timing	√
			2	**Instruction set of 8086**	
5	06-02-16	10.00-11.00		Addressing modes, Instruction formats	√
6	08-02-16	09.00-10.00		Instruction set	√
7	08-02-16	02.45-03.45		Continuation of instruction set	√
8	09-02-16	10.00-11.00		Continuation of instruction set	√
9	12-02-16	09.00-10.00		Continuation of instruction set	√
10	13-02-16	10.00-11.00		Continuation of instruction set	√
11	15-02-16	09.00-10.00		Continuation of instruction set	√
12	16-02-16	10.00-11.00		Directives & operators, Programs	√
13	19-02-16	09.00-10.00		Programs	√
14	20-02-16	10.00-11.00		Programs	√

				Byte and String manipulation	
15	22-02-16	09.00-10.00		String instructions, REP prefix	√
16	23-02-16	10.00-11.00		Table translation	√
17	26-02-16	09.00-10.00		Number format conversions	√
18	27-02-16	10.00-11.00	3	Procedures with examples	√
19	29-02-16	09.00-10.00		Macros with examples	√
20	29-02-16	02.45-03.45		Programming using keyboard	√
21	01-03-16	10.00-11.00		Video display	√
22	04-03-16	09.00-10.00		Programs	√
				8086 Interrupts	
23	05-03-16	10.00-11.00		8086 interrupts and interrupt responses	√
24	08-03-16	10.00-11.00		Hardware interrupt applications	√
25	11-03-16	09.00-10.00	4	Software interrupt applications	√
26	12-03-16	10.00-11.00		Interrupt examples	√
27	18-03-16	09.00-10.00		Continuation	√
28	19-03-16	10.00-11.00		Programs	√
				8086 Interfacing	
29	21-03-16	09.00-10.00		Keyboard interfacing circuit connections	√
30	22-03-16	10.00-11.00		Keyboard interfacing contd.	√
31	26-03-16	10.00-11.00	5	Interfacing of LED	√
32	28-03-16	09.00-10.00		Interfacing of LED	√
33	29-03-16	10.00-11.00		Stepper motor interfacing	√
34	01-04-16	09.00-10.00		Stepper motor interfacing contd	√

				8086 based multiprocessing systems	
35	02-04-16	10.00-11.00	6	Coprocessor configurations	√
36	04-04-16	09.00-10.00		8087 numeric data processor	√
37	04-04-16	03.45-04.45		Data types	√
38	05-04-16	10.00-11.00		Processor architecture	√
39	08-04-16	09.00-10.00		Instruction set	√
40	09-04-16	10.00-11.00		Instruction set contd.	√
41	11-04-16	09.00-10.00		Examples	√
	11-04-16	03.45-04.45		Examples	
			7	**System Bus Structure**	
42	12-04-16	10.00-11.00		8086 configuration – Min mode	√
43	22-04-16	09.00-10.00		Max mode	√
44	23-04-16	10.00-11.00		Peripheral component interconnect bus	√
45	25-04-16	09.00-10.00		Universal Serial bus	√
46	25-04-16	02.45-03.45		Printer interface	√
47	26-04-16	10.00-11.00		Printer interface	√
			8	**80386, 80486 and Pentium processors**	
48	29-04-16	09.00-10.00		Introduction to 80386	√
49	30-04-16	10.00-11.00		Registers	√
50	02-05-16	09.00-10.00		Introduction to 80486	√
51	03-05-16	10.00-11.00		Introduction to the Pentium microprocessor	√
52	06-05-16	09.00-10.00		Examples	√

53	07-05-16	10.00-11.00		(Beyond the syllabus) Applications – Measurement of temperature	
54	10-05-16	10.00-11.00		(Beyond the syllabus) DAC	
55	13-05-16	09.00-10.00		Revision	
56	14-05-16	10.00-11.00		Revision	
57	20-05-16	09.00-10.00		Revision	
58	21-05-16	10.00-11.00		Revision	

TEXT BOOKS:

1. **Microcomputer systems-The 8086 / 8088** Family – Y.C. Liu and G. A. Gibson, 2E PHI - 2003
2. **The Intel Microprocessor, Architecture, Programming and Interfacing**-Barry B. Brey, 6e, Pearson Education / PHI, 2003

REFERENCE BOOKS:

1. **Microprocessor and Interfacing- Programming & Hardware**, Douglas hall, 2nd, TMH, 2006.
2. **Advanced Microprocessors and Peripherals** - A.K. Ray and K.M. Bhurchandi, TMH, 2nd, 2006.
3. **8088 and 8086 Microprocessors - Programming, Interfacing, Software, Hardware & Applications** - Triebel and Avtar Singh, 4e, Pearson Education, 2003

Signature of the Faculty Signature of the HOD