Indra Ganesan
COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC
IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 1

CURRICULAR ASPECTS

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

INDRA GANESAN COLLEGE OF ENGINEERING

Criteria 1	Curricular Aspects	100

1.1 Curricular Planning and Implementation (20)

1.1.1 The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

Table of Content

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PREFACE OF THE COURSE FILE

Batch	: **2019-2023**
Academic Year	: **2021-2022 / Even**
Program	: **ELECTRONICS AND COMMUNICATION ENGINEERING**
Year & Semester	: **III Year / VI Semester**
Course Code	: **EC8691**
Name of the Course	: **Microprocessor and Microcontroller**
Faculty in-charge	: **Mrs.P.Santhana Selvi, AP/ECE**

Signature of the Faculty in-charge

HoD / ECE

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
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INDRA GANESAN COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty Time Table

Mrs.P.Santhna Selvi

Day Order	1	2	3	4	5	6	7	8
I				EC8691		EC8691		
II								
III	EC8691							
IV		EC8691						
V					EC8691			

S.Code	Title	Year / Branch	Hours
EC8691	Microprocessor and Microcontrollers	III/ECE	5
TOTAL - 5 hours			

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EC8691 MICROPROCESSORS AND MICROCONTROLLERS

L T P C
3 1 0 4

COURSE OBJECTIVES :

- To Explain the Architecture of 8086 microprocessor.
- To Write Assembly Language Programs.
- To learn the design aspects of I/O and Memory Interfacing circuits.
- To interface microprocessors with supporting chips.
- To study the Architecture of 8051 microcontroller.
- To design a microcontroller based system

UNIT I THE 8086 MICROPROCESSOR 9

Introduction to 8086 – Microprocessor architecture – Addressing modes - Instruction set and assembler directives – Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros – Interrupts and interrupt service routines – Byte and String Manipulation.

UNIT II 8086 SYSTEM BUS STRUCTURE 9

8086 signals – Basic configurations – System bus timing –System design using 8086 – I/O programming – Introduction to Multiprogramming – System Bus Structure – Multiprocessor configurations – Coprocessor, Closely coupled and loosely Coupled configurations – Introduction to advanced processors.

UNIT III I/O INTERFACING 9

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – D/A and A/D Interface - Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications Case studies: Traffic Light control, LED display , LCD display, Keyboard display interface and Alarm Controller.

UNIT IV MICROCONTROLLER 9

Architecture of 8051 – Special Function Registers(SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

UNIT V INTERFACING MICROCONTROLLER 9

Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation - Comparison of Microprocessor, Microcontroller, PIC and ARM processors

TOTAL: 45 PERIODS

At the end of the course, the student will be able to:

CO1: Explain the Architecture of 8086 microprocessor.
CO2: Write Assembly Language Programs.
CO3: Learn the design aspects of I/O and Memory Interfacing circuits.
CO4: Interfacing microprocessors with supporting chips.
CO5: Explain the Architecture of 8051 microcontroller.
CO6: Design a microcontroller based system

TEXT BOOKS:

1. Yu-Cheng Liu, Glenn A.Gibson, —Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Designl, Second Edition, Prentice Hall of India, 2007. (UNIT I- III)
2. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, —The 8051 Microcontroller and Embedded Systems: Using Assembly and Cl, Second Edition, Pearson education, 2011.

REFERENCES:

1. Doughlas V.Hall, —Microprocessors and Interfacing, Programming and Hardwarel,TMH,2012
2. A.K.Ray,K.M.Bhurchandi,lAdvanced Microprocessors and Peripherals —3rd edition, Tata McGrawHill,2012

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C310.1	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.2	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.3	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.4	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.5	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.6	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3

1- Low, 2- Medium, 3- high, - no correlation

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lecture Schedule

Degree/Program: **B.E / ECE** Course code &Name: **EC8691** – MicroProcessor and Microcontroller
Duration: Feb **2022 - May 2022** Semester: **VI** Section: **A** Faculty: **Mrs.P.Santhana Selvi**

AIM:

To teach the students about the various types of Microprocessor Architecture and Interfacing Ics.

OBJECTIVES:

To impart knowledge on

- To study the Architecture of 8086 microprocessor.
- To Write Assembly Language Programs.
- To learn the design aspects of I/O and Memory Interfacing circuits.
- To interface microprocessors with supporting chips.
- To study the Architecture of 8051 microcontroller.
- To design a microcontroller based system.

PREREQUISITES:

COURSE OUTCOMES:

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C310.1	Explain the functions of Architecture of 8086 microprocessor.	1,2,3,4,5,6,11,12	1,2,3
C310.2	Write Assembly Language Programs for different problems	1,2,3,4,5,6,11,12	1,2,3
C310.3	Design Memory Interfacing circuits.	1,2,3,4,5,6,11,12	1,2,3
C310.4	Analyze impedance matching by stubs using smith charts	1,2,3,4,5,6,11,12	1,2,3
C310.5	Analyze the characteristics of TE and TM waves	1,2,3,4,5,6,11,12	1,2,3
C310.6	Design a RF transceiver system for wireless communication	1,2,3,4,5,6,11,12	1,2,3

S.No	Date	Period	Topics to be Covered	Book & Page. No.
			UNIT- I: THE 8086 MICROPROCESSOR	Target periods :0
1	17.03.2022	2	Introduction to 8086	T1
2	18.03.2022	5	Microprocessor architecture	T1

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3	21.03.2022	4	Addressing modes	T1
4	21.03.2022	6	Instruction set	T1
5	24.03.2022	2	Instruction set	T1
6	25.03.2022	5	Assembler directives	T1
7	28.03.2022	4	Modular Programming - Linking and Relocation	T1
8	28.03.2022	6	Stacks - Procedures – Macros	T1
9	31.03.2022	2	Interrupts and interrupt service routines	T1
10	01.04.2022	5	Byte and String Manipulation	T1
11	04.04.2022	4	Introduction to Microprocessor and microcontroller	T1
				NPTEL
			UNIT- II: SYSTEM BUS STRUCTURE	**Target Periods :0**
12	04.04.2022	6	8086 signals	T1
13	07.04.2022	2	Basic configurations- Maximum mode	T1
14	08.04.2022	5	Minimum mode	T1
15	09.04.2022	5	System bus timing	T1
16	11.04.2022	4	I/O programming	T1
17	11.04.2022	6	Introduction to Multiprogramming	T1
18	18.04.2022	2	Multiprocessor configurations- Coprocessor	T1
19	18.04.2022	5	Closely coupled Coupled configurations	T1
20	21.04.2022	2	loosely Coupled configurations	T1
21	22.04.2022	5	Introduction to advanced processors	T1
22	23.04.2022	2	Advanced processor	T1
				NPTEL
			UNIT- III: I/O INTERFACING	**Target Periods :0**
23	25.04.2022	4	Memory Interfacing / I/O interfacing	T1
24	25.04.2022	6	Parallel communication interface	T1
25	28.04.2022	2	Serial communication interface 8251	T1
26	29.04.2022	5	D/A Interfacing	T1
27	02.05.2022	4	A/D Interfacing	T1
28	02.05.2022	6	8254 Timer/ Counter Interfacing with 8086	T1
29	05.05.2022	2	8279 Keyboard / Display controller	T1
30	06.05.2022	5	8237 DMA controller	T1
31	07.05.2022	4	Traffic Light control, LED display and Alarm Controller	T1
			UNIT- IV: MICROCONTROLLER	**Target Periods:0**
33	07.05.2022	6	Hardware Architecture	T2
34	09.05.2022	4	Special Function Registers(SFRs)	T2
35	09.05.2022	6	Special Function Registers(SFRs)	T2
36	12.05.2022	2	I/O Pins Ports and Circuits	T2
37	13.05.2022	5	Instruction set	T2
38	16.05.2022	4	Instruction set	T2
39	16.05.2022	6	Addressing modes	T2
40	19.05.2022	2	Assembly language programming.	T2
41	20.05.2022	4	Assembly language programming.	T2
42	20.05.2022	6	Advanced Microcontroller	T2
			UNIT- V INTERFACING MICROCONTROLLER	**Target Periods:0**
43	23.05.2022	4	Programming 8051 Timers.	T2
44	23.05.2022	6	Serial Port Programming	T2
45	26.05.2022	2	Interrupts Programming	T2
46	27.05.2022	5	LCD & Keyboard Interfacing	T2

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45	28.05.2022	5	ADC, DAC Interfacing	T2
46	30.05.2022	4	Sensor Interfacing	T2
47	30.05.2022	6	External Memory Interface	T2
48	02.06.2022	2	Stepper Motor	T2
49	03.06.2022	5	Waveform generation	T2
50	03.06.2022	7	Comparison of Microprocessor, Microcontroller, PIC and ARM processors	T2
			Content Beyond the Syllabus	
67	04/06/22		Advanced Microcontroller - PIC: i) Architecture ii) 8051 Vs. PIC iii) Applications of PIC	Material

Book Reference - Text Books

Sl.	Title of the Book	Author	Publisher	Year
1.	Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design	Yu-Cheng Liu, Glenn A.Gibson	Second Edition, Prentice Hall of India	2007
2	The 8051 Microcontroller and Embedded Systems: Using Assembly and C‖	Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay	Second Edition, Pearson education	2011

Book Reference- References

Sl	Title of the Book	Author	Publisher	Year
1.	Microprocessors and Interfacing, Programming and Hardware	Doughlas V.Hall	TMH	2012
2.	Advanced Microprocessors and Peripherals	A.K.Ray,K.M.Bhurc handi	3rd edition, Tata McGrawHIll	2012

Website Referencce:

http://nptel.iitm.ac.in/courses.php?branch=Electronics

www.freebookspot.com

Signature of the Faculty in-charge

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty :Mrs.P.Santhana Selvi **Course Code & Name: EC8691 – MicroProcessor and Microcontroller**

Degree & Program:B.E. /ECE **Semester & Section: III / A** **Academic Year: 2021 -2022 /EVEN**

I.Mapping of Course Outcomes with POs & PSOs.(before CBS)

Table.1 Mapping of COs, C, PSOs with POs - before CBS.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C310.1	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.2	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.3	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.4	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.5	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310.6	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3
C310	3	3	3	2	2	3	-	-	-	-	2	1	1	2	3

II. Identification of content beyond syllabus.

Table.2 Identification of content beyond syllabus

Details of Content Beyond Syllabus(CBS) added	POs strengthened/ vacant filled	CO/Unit
Advanced Microcontroller - PIC: i) Architecture ii) 8051 Vs. PIC iii) Applications of PIC	PO4,PO12 Strengthened	C310.6/ IV & V

III. Mapping of Course Outcomes with POs & PSOs. (After CBS)

Table.3 Mapping of COs, C, PSOs with POs- after CBS.

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C310.1	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3
C310.2	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3
C310.3	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3
C310.4	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3

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C310.5	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3
C310.6	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3
C310	3	3	3	3	2	3	-	-	-	-	2	3	1	2	3

Signature of the Faculty

HoD/ECE

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Proof of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty :Mrs.P.Santhana Selvi **Course Code & Name:EC8691- Microprocessor and Microcontroller**

Degree & Program:B.E. /ECE **Semester & Section: IV / A** **Academic Year: 2021 -2022 /EVEN**

Signature of the Faculty

HoD/ECE

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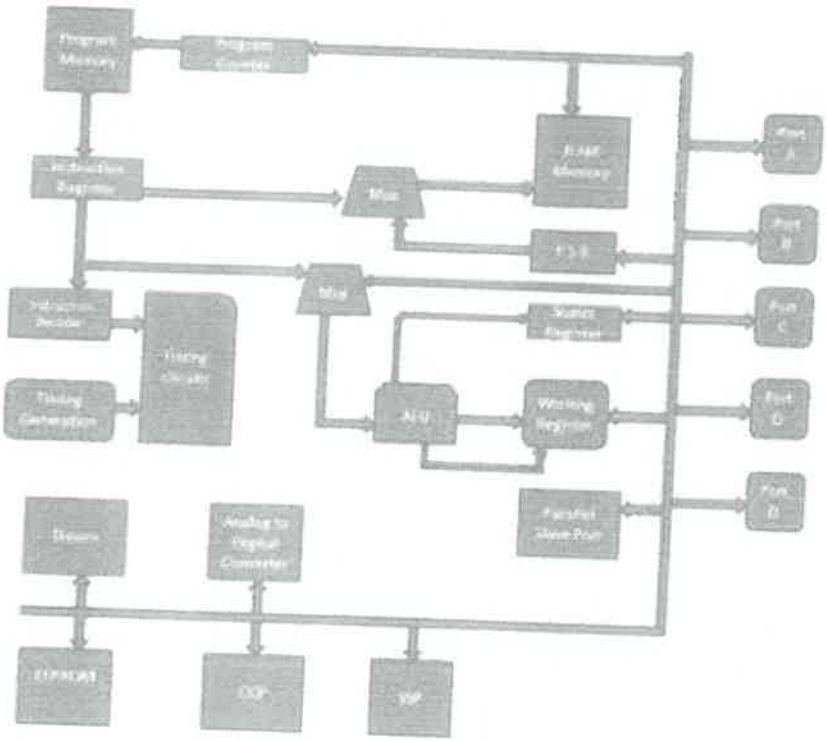
PERIPHERAL INTERFACE MICROCONTROLLER

PIC is a Peripheral Interface Microcontroller which was developed in the year 1993 by the General Instruments Microcontrollers. It is controlled by software and programmed in such a way that it performs different tasks and controls a generation line. PIC microcontrollers are used in different new applications such as smartphones, audio accessories, and advanced medical devices.

There are many PICs available in the market ranging from PIC16F84 to PIC16C84. These types of PICs are affordable flash PICs. Microchip has recently introduced flash chips with different types, such as 16F628, 16F877, and 18F452. The 16F877 costs twice the price of the old 16F84, but it is eight times more than the code size, with more RAM and much more I/O pins, a UART, A/D converter and a lot more features.

PIC Microcontrollers Architecture

The PIC microcontroller is based on RISC architecture. Its memory architecture follows the Harvard pattern of separate memories for program and data, with separate buses.



PIC microcontroller architecture

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1. Memory Structure

The PIC architecture consists of two memories: Program memory and Data memory.

Program Memory: This is a 4K*14 memory space. It is used to store 13-bit instructions or the program code. The program memory data is accessed by the program counter register that holds the address of the program memory. The address 0000H is used as reset memory space and 0004H is used as interrupt memory space.

Data Memory: The data memory consists of the 368 bytes of RAM and 256 bytes of EEPROM. The 368 bytes of RAM consists of multiple banks. Each bank consists of general-purpose registers and special function registers.

The special function registers consist of control registers to control different operations of the chip resources like Timers, Analog to Digital Converters, Serial ports, I/O ports, etc. For example, the TRISA register whose bits can be changed to alter the input or output operations of the port A.

The general-purpose registers consist of registers that are used to store temporary data and processing results of the data. These general-purpose registers are each 8-bit registers.

Working Register: It consists of a memory space that stores the operands for each instruction. It also stores the results of each execution.

Status Register: The bits of the status register denotes the status of the ALU (arithmetic logic unit) after every execution of the instruction. It is also used to select any one of the 4 banks of the RAM.

File Selection Register: It acts as a pointer to any other general-purpose register. It consists of a register file address, and it is used in indirect addressing.

Another general-purpose register is the program counter register, which is a 13-bit register. The 5 upper bits are used as PCLATH (Program Counter Latch) to independently function as any other register, and the lower 8-bits are used as the program counter bits. The program counter acts as a pointer to the instructions stored in the program memory.

EEPROM: It consists of 256 bytes of memory space. It is a permanent memory like ROM, but its contents can be erased and changed during the operation of the microcontroller. The contents into EEPROM can be read from or written to, using special function registers like EECON1, EECON, etc.

2. I/O Ports

PIC16 series consists of five ports, such as Port A, Port B, Port C, Port D, and Port E.

Port A: It is a 16-bit port, which can be used as an input or output port based on the status of the TRISA register.

Port B: It is an 8-bit port, which can be used as both an input and output port. 4 of its bits, when used as input, can be changed upon interrupt signals.
Port C: It is an 8-bit port whose operation (input or output) is determined by the status of the TRISC register.
Port D: It is an 8-bit port, which apart from being an I/O port, acts as a slave port for connection to the micro processor bus.
Port E: It is a 3-bit port that serves the additional function of the control signals to the A/D converter.

3. Timers

PIC microcontrollers consist of 3 timers, out of which the Timer 0 and Timer 2 are 8-bit timers and the Time-1 is a 16-bit timer, which can also be used as a counter.

4. A/D Converter

The PIC Microcontroller consists of 8-channels, 10-bit Analog to Digital Converter. The operation of the A/D converter is controlled by these special function registers: ADCON0 and ADCON1. The lower bits of the converter are stored in ADRESL (8 bits), and the upper bits are stored in the ADRESH register. It requires an analog reference voltage of 5V for its operation.

5. Oscillators

Oscillators are used for timing generation. PIC microcontrollers consist of external oscillators like crystals or RC oscillators. In the case of crystal oscillators, the crystal is connected between two oscillator pins, and the value of the capacitor connected to each pin determines the mode of operation of the oscillator. The different modes are low-power mode, crystal mode, and the high- speed mode. In the case of RC oscillators, the value of the Resistor and Capacitor determines the clock frequency. The clock frequency ranges from 30 kHz to 4 MHz.

6. CCP module:

A CCP module works in the following three modes:
Capture Mode: This mode captures the time of arrival of a signal, or in other words, captures the value of the Timer1 when the CCP pin goes high.
Compare Mode: It acts as an analog comparator that generates an output when the timer1 value reaches a certain reference value.
PWM Mode: It provides pulse width modulated output with a 10-bit resolution and programmable duty cycle.
Other special peripherals include a Watchdog timer that resets the microcontroller in case of any software malfunction and a Brownout reset that resets the microcontroller in case of

any power fluctuation and others. For a better understanding of this PIC microcontroller, we are giving one practical project which uses this controller for its operation.

Street Light that Glows on Detecting Vehicle Movement

This LED street light control project is designed to detect the vehicle movement on the highway to switch on a block of street lights ahead of it, and to switch off the trailing lights to save energy. In this project, a PIC microcontroller programming is done by using embedded C or assembly language.

The power supply circuit gives the power to a whole circuit by stepping down, rectifying, filtering, and regulating the AC mains supply. When there are no vehicles on the highway, all the lights remain off so that the power can be saved. The IR Sensors are placed on either side of the road as they sense vehicles' movement and in turn, send the commands to the microcontroller to switch on or off the LEDs. A block of LEDs will be on when a vehicle approaches near it and once the vehicle passes away from this route, the intensity becomes low or completely switched off.

The PIC microcontroller projects can be used in different applications, such as video games' peripherals, audio accessories, etc. Apart from this, for any help regarding any projects, you can contact us by commenting in the comment section.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Assignment Questions

Assignment – 01			Date of Issue:	04.09.2022	Marks	10
Course code	EC8691	Course Title	Microprocessor and Microcontroller			
Year	III	Semester/Section	IV / A	Date of Submission:	08.09.2022	

Q.No	Questions	CO
1.	Write an ALP Program for Sorting and Seaching.	C203.1
2.	Write an ALP Program for Sum of successive 10 numbers.	C203.1
3.	Write an ALP Program for Find the Odd and Even Number.	C203.1

Name and Signature of the Faculty Incharge

P. SANTHOSH SELVI

HoD/ECE

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Assignment Answer Sheet

Name of the Student : S.Surendran

AU Register Number: 811221106005

Assignment – 01						
Course code	EC8691	Course Title	Microprocessor and Microcontroller	Date of Issue:	04.09.2022	Marks: 10
Year	III	Semester/Section	IV / A	Date of Submission:	08.06.2022	

Q.No	Questions	CO
1.	Write an ALP Program for Sorting and Seaching.	C203.1
2.	Write an ALP Program for Sum of successive 10 numbers.	C203.1
3.	Write an ALP Program for Find the Odd and Even Number.	C203.1

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	6
Presentation Quality	2	2
Timely submission	2	2
Total marks	10	10

Name and Signature of the Faculty Incharge

T.SANTHANA SELVI

HoD/ECE

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Register Number:

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Internal Assessment Exam - 1			Date/Session	14.10.22/FN	Marks	60
Course code	EC8691	Course Title	Microprocessor and Microcontroller			
Regulation	2017	Duration	90 minutes	Academic Year	2021-2022	
Year	III	Semester	IV	Department	ECE	

COURSE OUTCOMES

CO1:	Function of the Architecture of 8086 microprocessor.
CO2:	Learn the design aspects of I/O and Memory Interfacing circuits.
CO3:	Interface microprocessors with supporting chips.
CO4:	Study the Architecture of 8051 microcontroller
CO5:	Design a microcontroller based system
CO6:	Study the Advanced Processors

Q.No.	Question	CO	BTS
	PART A		
	(Answer all the Questions 9 x 2 = 18 Marks)		
1	Define Microprocessor.	CO1	K1
2	List the flags of 8086.	CO1	K4
3	Calculate the physical address, when segment address is 1085H and effective address is 4537H	CO1	K2
4	Write down the features of 8086.	CO1	K1
5	What is the function of Accumulator?	CO1	K2
6	What is a subroutine program?	CO1	K2
7	What are the different types of addressing modes of 8086 instruction set?	CO1	K3
8	What are the different types of instructions in 8086 microprocessor?	CO1	K1
9	What is linker?	CO1	K3
10	Explain ALIGN & ASSUME.		
	PART B		
	(Answer all the Questions 2 x 14 = 28 Marks)		
11a	Draw the internal Architecture of 8086 Microprocessor and explain in detail about Execution Unit and Bus interface unit.	CO1	K3
	OR		
11b	Explain the 8086 Interrupt and Interrupt Service Routine.	CO1	K3
12a	Explain in detail about Assembler Directives.	CO1	K3
	OR		
12b	Write Short notes on Stack and Procedure.	CO1	K3
	PART C		
	(Answer all the Questions 1 x 14 = 14 Marks)		
13a	Write an Assembly Language program For Two 16 bit number Addition and multiplication	CO1	K3
	OR		
13b	Write an Assembly Language program For Two 16 bit number AND, OR, XOR, NOT logical operation	CO1	K3

Course Faculty 12/10/22

(Name /Sign / Date)

P. SANTHOSHA SELVI

HoD

(Name /Sign / Date)

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

INDRA GANESAN COLLEGE OF ENGINEERING

IG VALLEY, MANIDANDAM, TIRUCHIRAPPALLI – 620012

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

INTERNAL ASSESSMENT-I

SUBJECT CODE &TITLE: EC8691 – Microprocessor and Microcontroller

YEAR/SEM: II/III

MONTH & YEAR: June 2022

S.NO	REG NO	STUDENT NAME	CO1	Retest CO1	TOTAL (100)
1.	811219106001	Dayana P	45		90
2.	811219106002	Devika K	43		86
3.	811219106003	Dinesh J	21	32	42
4.	811219106004	Mohana Sundaram K	30		60
5.	811219106005	Ravikumar B	42		84
6.	811219106006	Santhanaraj A	20	30	40
7.	811219106008	Srikanth M	38		76
8.	811219106009	Surendran S	40		80
9.	811219106010	Surya V	19	34	38
10.	811219106011	Swetha K	42		84
11.	811219106301	Yuvashree S	40		80
12.	811219106701	Vijayalakshmi V	42		84
13.	811219106702	Ponnarasu S	42		84

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
0	0	2	1	0	3	4	6	0

Total No.of Candidates Present	13

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
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IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.

Total No.of Candidates Absent	**nil**
Total No.of Students Pass	**11**
Total No. of Students Fail	**3**
Percentage of Pass	**85%**

STAFF INCHARGE **HoD/ECE** **PRINCIPAL**

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 622 012, India
(Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

Internal Assessment Test Answer Book

Name	S. Surendran			**Year/ Semester/Section**	III / VI / A
Batch No.	2019-23	**Date/Session**	14/10/22/FN	**Department**	ECE
Course code	EC8691	**Course Title**	Microprocessors & Microcontroller.		
Internal Assessment Test	**IAT 1** ☑	**IAT 2** ☐	**IAT 3** ☐	**Model** ☐	
Name and Signature of the Invigilator with date	B J & 14/10/22 (B. SARASWATHI)				

Instruction to the Student: Put tick mark to the question attended in the column against question.

Part A			Part B / Part C						
Q. No.	✓	Marks	Q. NO.	✓	a Marks	✓	b Marks	Total Marks
1		2	11		11			11
2		2	12				10	10
3		1	13		8			08
4		2	14					
5		1	15					
6		-0-	16					
7		2					Total	29
8		1						
9		-0-						
10		-0-						
Total		11						

40
Grand Total

16/10/22
P. SOUNTHARYA SELVI
Name and Signature of the Examiner with date

To be filled by the examiner

Course Outcomes	1	2	3	4	5	6	Total
Marks allotted	60						
Marks Obtained	40						

IQAC Audit - Remarks

Name and Signature of the IQAC member

Dr. G. Balakrishnan, M.E., Ph.D.,
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty : P.Santhana Selvi

Degree & Program :B.E(ECE)

IA Test : I

Target : 85 %

Course Code & Name : EC8691- Microprocessor and Microcontroller

Semester & Section : III

University Exam/Month & Year: May /June -2022

Achieved : 85 %

S.NO	BATCH NO	NAME OF THE STUDENT	CAUSES FOR FAILURE	CORRECTIVE ACTION TAKEN	PREVENTIVE ACTION TAKEN	FOLLOWUP STATUS
1.	811219106003	Dinesh J	Health Issues	Retest conducted	Advised to take care on his health	Progress monitered
2.	811219106006	Santhanaraj A	Health Issues	Retest conducted	Advised to take care on his health	Progress monitered
3.	811219106010	Surya V	Health Issues	Retest conducted	Advised to take care on his health	Progress monitered

Signature of the Faculty Member

Signature of the HoD/ECE

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STUDENT FEEDBACK ON FACULTY
THEORY COURSE

ACADEMIC YEAR: 2021-2022 EVEN SEMESTER

Name of Department :	ECE	Year / Sem:	III / IV	Faculty Name	P.Santhana Selvi
Subject Code & Name	EC8691 –MICROPROCESSOR AND MICROCONTROLLER				

S.No.	QUESTIONS	Excellent	Very Good	good	Satisfactory	Somewhat Satisfactory	Not Satisfactory
		5	4	3	2	1	0
1.	Delivery of Lectures by Interactive Communication	9	4	0	0	0	0
2.	Use of Teaching Aids and ICT	9	4	0	0	0	0
3.	Level of Preparedness & Knowledge Level	11	2	0	0	0	0
4.	Involvement in mentoring and guiding	12	1	0	0	0	0
5.	Effective Time management	11	2	0	0	0	0
6.	Is the teacher completing syllabus as per lecture schedule?	13	0	0	0	0	0
7.	Is the teacher distributing answer scripts of students as per schedule?	11	2	0	0	0	0
8.	Is the teacher addressing grievances on answer scripts of IA while distributing?	13	0	0	0	0	0
9.	Is the teacher covering content beyond syllabus (CBS)?	11	2	0	0	0	0
10.	Is the teacher punctual to class?	11	2	0	0	0	0

HoD/ ECE

IQAC Co-ordinator

Principal

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RTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022 – 2023 (ODD SEMESTER)

STUDENTS MARK STATEMENT- CO BASED

INTERNAL ASSESSMENT-I

SUBJECT CODE &TITLE: AP5191 EMBEDDED SYSTEM DESIGN

YEAR/SEM: I/II **MONTH & YEAR: Feb 2019**

S.NO	REG NO	STUDENT NAME	CO1	Retest CO1	TOTAL (100)
1.	811218419002	Shalini K	36	45	81
2.	811218419003	Velrajeswari M R	41	43	84

MARKS RANGE:

<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
0	0	0	0	0	0	0	2	0

Total No.of Candidates Present	2
Total No.of Candidates Absent	Nil
Total No.of Students Pass	2
Total No. of Students Fail	0
Percentage of Pass	100 %

STAFF INCHARGE **HoD/ECE** **PRINCIPAL**

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