



SILIGURI INSTITUTE OF TECHNOLOGY
ELECTRONICS & COMMUNICATION ENGINEERING



COURSE FILE

1ST SEM, 3RD YEAR, 2015

PAPER NAME: Microprocessor & Microcontroller

PAPER CODE : CS-502 & CS-592

Course File

Course Title : **Microprocessor & Microcontroller (CS-502) &
Microprocessor & Microcontroller Lab. (CS-592)**

Semester : **3rd Year 1st , 2015**

Name of the Faculty: **Prof. Sarmistha Mondal**

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Class Schedule:

Lecture			Tutorial	Practical	
Monday 10:00 a.m -10:50 a.m	Tuesday 11:40 a.m - 12:30 p.m	Wednesday 10:50 a.m - 11:40 a.m	Thursday 15:50 p.m - 16:40 p.m	Monday 10:50 a.m -1:20 p.m	Thursday 10:50 a.m -1:20 p.m

Hours for meeting students:

Wednesday 10:50-11:40pm	Saturday 10.00 a.m - 10.50 a.m	Other Days 1.30pm – 2:10pm or by appointment
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i) Course Objective

Students will be able to demonstrate architecture & programming technique of 8085 & 8086 microprocessors , 8051 microcontroller and design system based on them.

ii) Course Outcomes

- After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The student will be able to:

Outcomes		Target
CS-502.1	Recognizing the internal architecture organization of 8085. [B.T Level-1]	50% marks

CS-502.2	Understand the interrupt and subroutine call mechanism of microprocessor & utilize 8255 / 8237/ 8259 /8251 for peripheral interfacing. [B.T Level-2]	50% marks
CS-502.3	Analyze 8086 microprocessors & 8051 microcontrollers , addressing modes, registers and instruction sets and apply them in writing assembly language program. [B.T Level-4]	50% marks
CS-502.4	Debug their assembly language programs. [B.T Level-5]	70% marks
CS-502.5	Design microprocessors/microcontrollers-based systems. [B.T Level-6]	70% marks

- ii. Once the student has successfully complete this course, he/she must be able to answer the following questions or perform/demonstrate the following:

Sl.	Question	BT Level
1.	Write the basic difference between microprocessor & microcontroller .	1
2.	Describe the functions of the following pins: ALE,HOLD,RD',READY,IO/M'	1
3.	Summarize the different addressing modes of 8085.	2
4.	Briefly discuss the sequence of events that takes place while executing CALL instruction.	3
5.	Analyze the memory segmentation scheme with reference to 8086 microprocessor.	4
6.	Compare the role of MIN mode and MAX mode operation of 8086.	4
7.	Find the largest number or data from a given set of 10 8-bit data using 8085 assembly language.	4
8.	Study the display of square-wave on CRO integrating the interfacing of 8085 & 8255 PPI. Consider Port-A as output port and Port-B as input port.	4
9.	Identify the particular data 02H using table look-up program of 8085 assembly language from a set of 5, 8-bit numbers. If found , store FFH, otherwise store 00H in register E .	4
10.	Write an assembly language program to generate quotient and remainder after the division of 2, 8-bit numbers using 8051 microcontroller.	5

iii) Unit Layout

Unit	Lecture Hours	Laboratory Hours	Tutorial Hours
I. Introduction to Microcomputer based system. History of evolution of Microprocessor & Microcontrollers and their advantages and Disadvantages. Architecture of 8085 Microprocessor, Pin description of 8085. Address/databus Demultiplexing, Status Signals and the control signals. Instruction set of 8085 microprocessor, Addressing modes, Timing diagram of the instructions, Assembly language programming with examples, Counter and Time Delays	12	15	4
II. Stack and Subroutine, Interrupts of 8085 processor (software and hardware), I/O Device Interfacing-I/O Mapped I/O and Memory Mapped I/O,	6	3	2
III. Serial (using SID and SOD pins and RIM, SIM Instructions) and Parallel data transfer. Memory interfacing with 8085. Support IC chips- 8255, 8251, 8237 / 8257, 8259	12	6	4
IV. 8086 Microprocessor, Brief introduction to PIC microcontroller (16F877), 8051 Microcontroller, Memory interfacing with 8086. Support IC chips- 8255, 8251, 8237 / 8257, 8259,	8	6	2

iv) Textbooks

1. MICROPROCESSOR architecture, programming and Application with 8085 - **R. Gaonkar** (Penram international Publishing LTD.)
2. Microprocessors and Microcontrollers - **N. Senthil Kumar**, M. Saravanan and Jeevananthan (Oxford university press)
3. Fundamentals of Microprocessor and Microcontroller – **B. Ram** (Dhanpat Rai Publications)

Reference books:

1. Microprocessor 8085 and its Interfacing—S Mathur (PHI)
2. Microprocessors and Interfacing – 8086, 80286, 80386, 80486 - Douglas V. Hall (Tata Mcgraw-hill)
3. The X-86 PC Assembly language, Design and Interfacing - Mazidi, Mazidi and Causey (PEARSON)
4. 8051 Microcontroller – K. Ayala (Cengage learning)
5. Fundamentals of Microprocessor & its Application - Singh, Chhabra (S. Chand publication)

(v) Evaluation Scheme

1) Theory

Evaluation Criteria	Marks
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Internal Exam*	15
Assignment	10
Attendance	5
University Exam	70
Total	100

* Two internal examinations are conducted; based on those two tests, average of them are considered in a scale of 15.

University Grading System:

Grade	Marks
O	90% and above
E	80 – 89.9%
A	70 – 79.9%
B	60 – 69.9%
C	50 – 59.9%
D	40 – 49.9%
F	Below 40%

2) Laboratory

Evaluation Criteria	Marks
Internal Exam*	40
University Exam	60
Total	100

* Internal Evaluation will be based on daily lab performance as per the following schedule:

Expt. No.	Experiment Name	Schedule	Marks
1	Introduction - Study of prewritten programs on 8085 trainer kit using the basic instruction set (data transfer, load/store, arithmetic, logical).	3HRS.	4
2	<u>To perform the programs on 8085 trainer kit:</u> 1 . Write a program to add 2, 8 bit data stored in internal registers. 2 . Write a program to subtract 2, 8 bit data stored in internal registers. 3 . Write a program to add 2, 8 bit data after storing it two consecutive memory location and store the output in the next location. 4 . Store any 8 bit data in register D and another data in 8000H memory location. Subtract the data of memory from the data of	3 HRS.	4

	register and store the output in 8002H memory location.		
3	<p><u>To perform the programs on 8085 trainer kit :</u></p> <ol style="list-style-type: none"> 1 . Write a program add to 16 bit data using DAD instruction. 2 . Write a program add to 16 bit data using without DAD instruction. 3 . Write a program to add n natural nos. 4 . Write a program n natural nos. after storing it in consecutive memory location. 	3 HRS.	4
4	<p><u>To perform the programs on 8085 trainer kit :</u></p> <ol style="list-style-type: none"> 1. Write a program to multiply 2, 8 bit data. 2. Write a program to divide 2, 8 bit data. 3. Write a program to copy a block of memory and shift it into another memory location. 4. Write a program to add n even/odd data stored in consecutive memory location. 	3 HRS.	4
5	<p><u>To perform the programs on 8085 trainer kit :</u></p> <ol style="list-style-type: none"> 1. Write a program to add n BCD nos. 2. Write a program to arrange a set of data in ascending/ descending order in consecutive memory location. 3. Write a program to pack 2 BCD nos. 4. Write a program to unpack 2 BCD nos. 	3 HRS.	4
6	<p><u>To perform the programs on 8085 trainer kit :</u></p> <ol style="list-style-type: none"> 1. Write a program to search a particular data in a set of data store in consecutive memory location (table look up). 2. Write a program to check whether two set of data in memory are match or not (string matching). 3. Write a program to convert BCD no. into binary no. 4. Write a program to convert binary no. to BCD no. 	3 HRS.	4
7	<p><u>To perform the programs on 8085 trainer kit :</u></p> <ol style="list-style-type: none"> 1. Write a program to add n 16 bit data. 2. Write a program to convert any hexadecimal no. into ASCII no. 3. Write a program to convert any binary no. into ASCII no. 4. Write a program to convert any ASCII no. into binary no. 	3 HRS.	4
8	<p><u>To perform the programs on 8085 trainer kit :</u></p> <ol style="list-style-type: none"> 1. Write a program to ON LED's after reading the status of its switch. 	3 HRS.	4

	<p>2. Write a program to ON all LED's at the same time.</p> <p>3. Write a program to ON all the LED's one by one with particular delay.</p> <p>4. Write a program to display a square/rectangular wave in CRO.</p>		
9	<p><u>Familiarization with 8051 microcontroller kit and perform the programs in it :</u></p> <p>1. Write a program to add 2, 8 bit data stored in registers.</p> <p>2. Write a program to subtract 2, 8 bit data stored in registers.</p>	3 HRS.	4
10	<p><u>To perform the programs on 8051 trainer kit :</u></p> <p>1. Write a program to multiply 2, 8 bit data stored in registers.</p> <p>2. Write a program to divide 2, 8 bit data stored in registers.</p> <p>3. Serial communication between 2, 8085 trainer kit.</p>	3 HRS.	4
11	Revision (on the programming of 8085)	3 HRS.	-
12	Revision (on the programming of 8051)	3 HRS.	-

Course target attainment levels:

Attainment Level	Inference	Marks
Attainment Level 1	40% of the students have attained more than the target level of that CO	1
Attainment Level 2	50% of the students have attained more than the target level of that CO	2
Attainment Level 3	60% of the students have attained more than the target level of that CO	3

Overall Course Attainment Target (70% of university and 30% of the internal exam) will be = Attainment Level 3

Target has been set on the basis of last year's performance / result by the students, student quality this year and difficulty level of the course.

(vi) Mapping of Course Outcomes and Program Outcomes:

Course Outcomes	Program Outcomes												PSOs	
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	1.	2.
CS-502.1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CS-502.2	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CS-502.3	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CS-502.4	1	-	2	-	-	1	-	-	1	-	-	1	1	1
CS-502.5	1	-	2	-	-	1	-	-	1	-	-	1	1	1
CS-502	1	-	2	-	-	1	-	-	1	-	-	1	1	1

- CO1 to CO5 partially satisfies the application of knowledge of mathematics, science, engineering fundamentals to the solution of complex engineering problems (**PO1**).
- CO4 & CO5 fully satisfies the Design solutions for design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, & the cultural and societal, environmental consideration(**PO3**).
- CO4 & CO5 minimally satisfies for the students to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice (**PO6**).
- CO4 & CO5 minimally satisfies for the students to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings (**PO9**).
- CO4 & CO5 minimally satisfies for the students to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change (**PO12**).

(vii) Delivery Methodology

Outcome	Method	Supporting Tools	Demonstration
CS-502.1	Structured (Partially Supervised Whole-Class Grouping)	Blackboard & Chalk, Video Lecture, NPTEL materials	Memorizing the internal architecture & organization of 8085, its addressing mode.
CS-502.2	Structured (Partially Supervised Whole-Class Grouping)	Blackboard & Chalk, Video Lecture, NPTEL materials	Understanding the interrupt and subroutine call mechanism of microprocessor & utilize 8255 / 8237/ 8259 /8251 for peripheral interfacing.
CS-502.3	Structured (Partially Supervised Whole-Class Grouping)	Blackboard & Chalk, Video Lecture, NPTEL materials	Studying the basics of 8086 microprocessors & 8051 microcontrollers , addressing modes, registers and instruction sets and apply them in writing assembly language program.
CS-502.4	Structured (Partially Supervised Independent work)	Experimental Kit of 8085	Demonstrate 8085 assembly language programming
CS-502.5	Structured (Partially Supervised Independent work)	Experimental Kit of 8051	Ability to design microprocessor/microcontroller based systems using assembly language programming.

(viii) Assessment Methodology

Outcome	Assessment Tool	Specific Question / activity aligned to the Outcome
CS-502.1	Internal Test	<p>1. If the clock frequency is 5MHZ, then the execution time of the instruction MVI B,00 H is</p> <p>a) 1.8 μs b) 1.4 μs c) 1.4 ms d) 0.4 ms</p> <p>2. Address line required for addressing 32k-byte memory chip is</p> <p>a) 13 b) 14 c) 15</p>

		d) 16 3. Briefly discuss the different addressing modes of 8085.
	Assignment	1. What are the functions of ALE, HOLD, READY ,RD,WR? 2. Interface 2K×8 RAM with 8085 microprocessor using IC 74138 such that starting address assign to them are 8000H. 3. Define instruction cycle, machine cycle and T-state
	University Exam	1. 2.
CS-502.2	Internal Test	1. Which of the following interrupt is both edge and level sensitive- a) RST 5.5 b) RST 6.5 c) RST 7.5 d) TRAP 2. The total I/O space available in 8085 if used peripheral mapped I/O is a) 64 b) 128 c) 256 d) 512 3. What is the difference between RIM and SIM instruction?
	Assignment	1. Discuss the different bits of control word of 8255. 2. Discuss the BSR mode operation of 8255.
	University Exam	1
CS-502.3	Internal Test	1. Discuss the flag register of 8086. 2. How 8086 supports pipelining? Explain. 3. State the function of BIU and EU in 8086. 4. What are the advantage of having segmentation?
	University Exam	1.
CS-502.4	Lab	1. Write an assembly language program to add two 16 bit numbers without using DAD instruction. 2. Write an assembly language program to divide 09H by 02H.Store the result in register D and remainder in register C. 3. Write an assembly language program to read the switch state & glowing LEDs according to switch state using 8255 PPI.

CS-502.5	Lab	<p>1. Write an 8051 assembly language program for the multiplication of 2, 8-bit numbers stored in internal register.</p> <p>2. Write an 8051 assembly language program for the subtraction of 2, 8-bit numbers, stored in internal register.</p>
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(ix) A. Weekly Lesson Plan

Week	Lectures	Tutorial	Practical
1	<p>Introduction to Microprocessor based system, History of microprocessor, SSI,MSI,LSI & VLSI; Microprocessor & Microcontroller, 8-bit & 16-bit microprocessor, word length, bit, byte, software & hardware of a microprocessor, Memory & I/o, pin description of 8085, Organization of microprocessor based system-ALU, reg. Array & control unit, Computer languages-High level, low level, Assembly & Machine language, compiler, interpreter & assembler. MP architecture & operations, Address bus, Data bus, Control bus & their functions in reference to 8085, demultiplexed address-data bus, 8085 register array, internal data operations,</p>	<p>Revision of : Microprocessor based system History of microprocessor, SSI,MSI,LSI & VLSI; Microprocessor & Microcontroller, 8-bit & 16-bit microprocessor, Bit, byte, software & hardware of a microprocessor, Memory & I/o, pin description of 8085, Organization of microprocessor based system-ALU, reg. Array & control unit, Address bus, Data bus, Control bus & their functions in reference to 8085, demultiplexed address-data bus, 8085 register array</p>	-
2	<p>8085 assembly & machine languages: mnemonics, hexcode, operand; Writing & execution of A.L.P, introduction to 8085</p>	<p>Revision: mnemonics, hexcode, operand, introduction to 8085</p>	-

	instructions, Tri state logic, function of buffer, decoder, latches, R/W memory model, memory organization, memory addressing,	instructions, Tri state logic, function of buffer, decoder, latches, op-code fetch cycle,R/W memory model, Writing program in assembly language of 8085	
3	8085 instruction sets: data transfer, arithmetic, logical & branching instruction,Counter and time delay, Memory mapping, Memory interfacing using IC-74138 decoder, Sequence of fetching of opcode with examples; Instruction cycle, Machine cycle & T-state, calculation of T-states of a given instruction,	Revision: Memory interfacing using IC-74138 decoder, Instruction cycle, Machine cycle & T-state, Counter and time delay calculation	-
4	Timing Diagram of a given instruction- 1 byte, 2-byte, 3- byte instruction, Addressing modes of 8085	Revision of : Timing Diagram of a given instruction-SUB C; MOV A,M; ANI F0 H; LDA ; addressing modes of 8085	Assgn. – 1 Classification of Signals and Systems
5	Stack & Stack pointer, PC & their uses, Assembly language programming, Instructions: PUSH,POP related to stack, PUSH/POP & their timing diagram, Assembly language programming using Stack,	Revision of: STACK and related instructions- PUSH/POP	-
6	Subroutine & its uses, CALL & RET , Sequence of program execution while a subroutine is called, Assembly language programming using subroutine, Conditional CALL/RET, Multiple ending, common ending & nesting subroutine	Revision on Subroutine & its uses, CALL & RET , Sequence of program execution while a subroutine is called, Assembly language programming using subroutine	-

7	Interrupts of 8085 : software & hardware, RIM & SIM, their uses. serial data transfer using SID, SOD & RIM/SIM , I/O mapped I/O & memory mapped I/O,	Revision on Software & hardware, RIM & SIM, their uses. serial data transfer using SID, SOD & RIM/SIM	Assgn. – 2 Signal Transformation
8	Discussion of 1 st internal exam question & answer and result,	Assembly language programming	-
9	Introduction to Programmable Peripheral Interfacing(PPI) using 8255, various operating modes : I/O and BSR, mode-0,mode-1,mode-2 operations along with their control-word format. Instructions: IN & Out, Assembly language programming using 8255 interfaced with 8085.	Revision on 8255 : various operating modes : I/O and BSR, mode-0,mode-1,mode-2, Instructions: IN & Out, Assembly language programming using 8255 interfaced with 8085	Assgn. – 3 Fourier Transform
10	Functions of 8259- programmable interrupt controller, Process of DMA, 8237- programmable DMA controller	Revision on 8259, 8237	-
11	8251-USART, 8086 introduction, architecture, addressing modes, Interrupts of 8086, segmentation & pipelining.	Revision on 8251, Basics of 8086	-
12	Basic idea on PIC microcontroller 8051 microcontroller, pin description, 8051-interrupts, architecture, Assembly language programming of 8051	Revision on microcontroller, Assembly language programming of 8051	

B. Daily Lesson Plan

Unit : 1 Title : Introduction to Microprocessor based system Date: 20/7/15 Day 1: Monday, 10:00-10:50
CONTENTS Introduction to signals and systems. Discussion on course objectives and outcome, text & reference books, evaluation scheme and weekly lesson plan. Introduction to Microprocessor based system History of microprocessor,

SSI,MSI,LSI & VLSI; Microprocessor & Microcontroller, 8-bit & 16-bit microprocessor.
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. capable of understanding the need of microprocessor 2.learn the basic concept of processor 3. Learn the relationship between binary code & hexadecimal code. 4. capable of understanding the term SSI,MSI,VLSI 5.be able to understand the difference between MP & MC 3. capable of understanding the word length of a processor
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1.Draw a block diagram of microprocessor based system.[B.T Level 1] 2.Find the role of I/o . [B.T Level 1] 3. What is the role of memory in MP based system? [B.T Level 2]
Remarks, if any

<p>Unit : 1</p> <p>Title : Introduction to Microprocessor based system</p> <p>Date: 21/7/15 Day2: Tuesday, 11:40-12:30</p>
<p>CONTENTS</p> <p>Bit, byte, software & hardware of a microprocessor, Memory & I/o, pin description of 8085, Organization of microprocessor based system-ALU, reg. Array & control unit, Computer languages-High level, low level, Assembly & Machine language, compiler, interpreter & assembler.</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. To understand the difference between H/W & S/W. 2. To Learn the difference between bit, byte and wordlength. 3. To realize the difference between compiler, interpreter & assembler
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. Define bit, byte & word. [B.T Level 2] 2. Differentiate between compiler and interpreter .[B.T Level 2] 3.What is called software? [B.T Level 2]
Remarks, if any

<p>Unit : 1</p> <p>Title : Introduction to Microprocessor architecture & organization</p> <p>Date: 22/7/15 Day3: Wednesday, 10:50-11:40</p>
CONTENTS

MP architecture & operations, Address bus, Data bus ,Control bus & their functions in reference to 8085, demultiplexed address-data bus, 8085 register array, internal data operations.
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Be able to understand the different bus system 2. Learn the different signal classification of 8085. 3. Realize the role of demultiplexed address-data bus.
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1.What is ROM & RAM? [Level 2] 2.What is the function of WR' signal on memory chip? [Level 2] 3.What are the control signals of 8085? [Level 2]
Remarks, if any

Tutorial-1
Title : Date: 23/7/15 Day4: Thursday, 15:50-16:40
<p>CONTENTS</p> <p>Revision of : Microprocessor based system ,pin description of 8085, Organization of microprocessor based system-ALU, reg. Array & control unit, Address bus, Data bus ,Control bus & their functions in reference to 8085, demultiplexed address-data bus, 8085 register array</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. To understand basic Microprocessor based system ,pin description of 8085, 2. To realize ALU, reg. Array & control unit, Address bus, Data bus ,Control bus & their functions in reference to 8085
Tutorial sheet-1
<ol style="list-style-type: none"> 1. Write the main difference between Microprocessor & Microcontroller. 2. Find the purpose of demultiplexed address-data bus. 3. Compare software-hardware & compiler-interpreter. 4. Explain the function of different control & status signal of 8085. 5. Describe the register array of 8085
Remarks, if any

Unit : 1
Title : 8085 assembly & machine languages: Date: 27/7/15 Day5: Monday, 10:00-10:50
<p>CONTENTS</p> <p>8085 assembly & machine languages: mnemonics, hexcode,operand</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Understand the role assembly & machine languages . 2. To define the mnemonics, hexcode, operand

<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1.What is opcode? [B.T Level 2] 2.Define mnemonics. [B.TLevel 2]
Remarks, if any

<p>UNIT: 1 Title : Machine & assembly language related to Instruction format of 8085. Date: 28/7/15 Day6: Tuesday, 11:40-12:30</p>
<p>CONTENTS Writing & execution of A.L.P, introduction to 8085 instructions</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. To introduce with different instruction format</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What is 1-byte, 2-byte and 3-byte instructions? [B.T Level 2] 2. What are the different instruction format of 8085? [B.T Level 2]
Remarks, if any

<p>UNIT: 1 Title : Tri state logic, function of buffer, decoder, latches, R/W memory model, Date: 29/7/15 Day7: Wednesday, 10:50-11:40</p>
<p>CONTENTS Utility of Tri state logic, function of buffer, decoder, latches, R/W memory model</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. 1.To understand the function of buffer, decoder, latches in microprocessor 2. To understand the different parts of memory block 3. To realize the different sequence of op-code fetch cycle</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What is assembly language? [B.TLevel 2] 2.What do you mean by mnemonics? [B.T Level 2] 3.What is the difference between opcode & operand? [B.T Level 2] 4. Learn about the steps of op-code fetch cycle. [B.TLevel 2]
Remarks, if any

<p>UNIT: 1</p> <p>Date: 30/7/15 Day8 : Thursday, 15:00-15:50 – Tutorial -2</p>
<p>CONTENTS</p> <p>Revision: mnemonics, hexcode,operand, introduction to 8085 instructions, Tri state logic, function of buffer, decoder, latches, op-code fetch cycle,R/W memory model,</p>
<p>Tutorial sheet-2</p> <ol style="list-style-type: none"> 1. Write the difference between opcode & operand. 2. List out the categories of the 8085 instructions. Give examples of the instructions for each group. 3. Write the output if the input is F0: <ul style="list-style-type: none"> LXI H,2050H MOV A,M CMA ADI 01 STA 2060 4. Describe the opcode fetch cycle of 8085. 5. Discuss about the basic R/W memory model.

<p>UNIT: 1</p> <p>Title : Memory mapping & interfacing using IC-74138 decoder</p> <p>Date: 03/08/15 Day9: Monday, 10:50-11:40</p>
<p>CONTENTS</p> <p>Memory mapping, memory organization, memory addressing, Memory interfacing using IC-74138 decoder</p>
<p>Unit Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Realize the Memory mapping, Memory interfacing 2. Be able to understand the operation of IC 74138.

<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. How many address line required for 32 k-byte memory chip? [B.T Level 2] 2.Design how one 1K ROM & one 2K ROM can be interfaced with 8085. Start from the address 0000H. [B.T Level 3]
Remarks, if any

<p>UNIT: 1 Title : Sequence of opcode fetch- Instruction cycle, Machine cycle & T-state, Counter and time delay Date: 04/08/15 Day 10: Tuesday, 11:40-12:30</p>
<p>CONTENTS Sequence of opcode fetch- with examples; Instruction cycle, Machine cycle & T-state, calculation of T-states of a given instruction, Counter and time delay calculation</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. To understand instruction cycl, machine cycle and T-states. 2.To understand the calculation of counter and time delay of a given program </p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. Define instruction cycle. [B.T Level 2] 2.How many time is s required to execute MVI A, 05 H? [B.T Level 2] 3.If the 8085 is connected with a crystal of 2 MHZ, how much time is needed to execute the instructions: DELAY:MVI C ,FF DCR C JNZ DELAY
Remarks, if any

<p>UNIT: 1 Title : Internal data operation of 8085 Date: 05/08/15 Day11: Wednesday, 10:50-11:40</p>
<p>CONTENTS Different cycles of op-code fetch using timing diagram</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Be able to understand the different sequence of execution of a instruction in accordance to timing diagram . </p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p>

1.Draw the timing diagram of opcode fetch cycle of 8085.[B.TLevel 2]
Remarks, if any

TOPIC/UNIT/ CHAPTER: 3 Date: 06/08/15 Day12: Thursday, 15:50-16:40- Tutorial - 3
CONTENTS Revision: Memory interfacing using IC-74138 decoder, Instruction cycle, Machine cycle & T-state, Counter and time delay calculation
Tutorial Sheet-3
<ol style="list-style-type: none"> 1. Define instruction cycle, machine cycle and T-state. 2. Write a single instruction to clear the lower four bits of the accumulator in 8085 assembly language. 3. Determine how much time is s required to execute the instruction ADI F0H. [B.T Level 2] 4. If the clock frequency is 5MHZ, then what is the execution time of the instruction MVI B,00 H? [B.T Level 3] 5. Draw the opcode fetch cycle of 8085. [B.T Level 2]

UNIT: 1 <p style="text-align: center;">Title : Timing Diagram of a given instruction Date: 10/08/15 Day13: Monday, 10:00-10:50</p>
CONTENTS Timing Diagram of a given instruction- 1 byte, 2-byte, 3- byte instruction
UNIT Objectives: Broad Objectives of the chapter/topic are: 1.To understand the timing diagram of 1-byte , 2-byte
Once the student has completed this topic/ chapter he/she will be able to answer following

<p>questions/perforM the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. Draw the timing diagram of MOV A,B. [B.T Level 2] 2. Draw the timing diagram of ADD M. [B.T Level 2] 3. Draw the timing diagram of MVI C, 08 H. [B.T Level 2]
Remarks, if any

<p>UNIT: 4 Title : Timing Diagram of a given instruction- 1 byte, 2-byte, 3- byte instruction Date: 11/08/15 Day14: Tuesday, 12:30-13:20</p>
<p>CONTENTS Timing Diagram of a given instruction- 1 byte, 2-byte, 3- byte instruction</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. To understand the timing diagram of 2-byte instruction</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perforM the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. How many number of T-states required to execute JNZ 8050H H? [B.T Level 3] 2. Draw the timing diagram of LDA 9000H. [B.T Level 2]
Remarks, if any

<p>UNIT: 5 Title : Timing Diagram of a given instruction, Addressing modes of 8085 Date: 12/08/15 Day15: Wednesday, 10:50-11:40</p>
<p>CONTENTS Timing Diagram of a given instruction- 3- byte instruction, Addressing modes of 8085</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. To understand the different Addressing modes of 8085</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perforM the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What are the different addressing mode of 8085? explain with examples. [B.T Level 2]
Remarks, if any

<p>CHAPTER: 4</p> <p>Title : Timing Diagram of a given instruction- 1 byte, 2-byte, 3- byte instruction, addressing modes of 8085</p> <p>Date: 13/08/15 Day16: Thursday, 15:50-16:40(Tutorial-4)</p>
<p>CONTENTS</p> <p>Revision of : Timing Diagram of a given instruction- 1 byte, 2-byte, 3- byte instruction, addressing modes of 8085</p>
<p>Tutorial sheet – 4</p> <ol style="list-style-type: none"> 1. Draw the timing diagram of opcode fetch cycle of a 2- byte instruction. 2. List the number of machine cycles does 8085 have, mention them. 3. Draw the timing diagram for the instructions-a. LDA, b. ADD M. 4. Classify the different addressing modes of 8085.

<p>UNIT: 2</p> <p style="text-align: center;">Title : Stack & Stack pointer, PC & their uses</p> <p style="text-align: center;">Date: 17/08/15 Day 17: Monday, 10:00-10:50</p>
<p>CONTENTS</p> <p>Stack & Stack pointer, PC & their uses,</p>
<p>Unit Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <p>1.capable of understanding the concept of Stack & Stack pointer, PC & their uses,</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom’s Taxonomy):</p> <ol style="list-style-type: none"> 1. What is the use of stack memory? [B.T Level 2] 2.Which stack is used in 8085, LIFO or FIFO? [B.T Level 2]
<p>Remarks, if any</p>

UNIT: 2 <p style="text-align: center;">Title : STACK & Instructions: PUSH,POP Date: 18/08/15 Day18 : Tuesday, 11:40-12:30</p>
CONTENTS Instructions- PUSH, POP related to stack & their timing diagram
UNIT Objectives: Broad Objectives of the chapter/topic are: 1.Capable of understanding the requirement of the instruction PUSH, POP 2. Be able to Draw the timing diagram of PUSH, POP
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. Draw the timing diagram of PUSH B. [B.T Level 2]
Remarks, if any

UNIT: 2 <p style="text-align: center;">Title : Assembly language programming using Stack Date: 19/8/15 Day19 : Wednesday, 10:50-11:40</p>
CONTENTS Assembly language programming using Stack
UNIT Objectives: Broad Objectives of the chapter/topic are: 1. To Perform the different assembly language program using STACK 2.
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. Write an ALP for exchanging the data of two registerpair using PUSH & POP. [B.T Level-3]
Remarks, if any

UNIT: 2 Title : STACK & its use Date: 20/8/15 Day20: Thursday, 15:50-16:40 (Tutorial – 5)
CONTENTS Revision of: STACK and related instructions- PUSH/POP

Tutorial Sheet-5

1. Which stack is used in 8085, LIFO or FIFO?
2. **Write** short notes on: Stack memory.
3. What is the **utilization** of STACK memory?
4. Draw the timing diagram of : POP H.

UNIT: 2 Title : Subroutine & its uses, Date: 24/08/15 Day 21: Monday, 10:00-10:50
CONTENTS Subroutine & its uses, , Sequence of program execution while a subroutine is called
UNIT Objectives: Broad Objectives of the chapter/topic are: 1. Understand Sequence of program execution while a subroutine is called
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. Why we use subroutine? [Level 2] 2.Explain the purpose of stack while calling a subroutine. [B.T Level 2]
Remarks, if any

Assignment-1

1. What is Microprocessor? Give the power supply & clock frequency of 8085 .
2. What are the functions of accumulator?
3. List the 16 – bit registers of 8085 microprocessor.
4. List the allowed register pairs of 8085.
5. What is an Opcode and Operand?
6. What is the function of IO/M,RD,WR signals in the 8085?
7. If the clock frequency is 5MHZ, then what is the execution time of the instruction MVI B,00 H ?
8. List out the categories of the 8085 instructions. Give examples of the instructions for each group.
9. How many address lines in a 4096 x 8 EPROM CHIP?
10. Name the three instructions to clear accumulator content .
11. What is the signal classification of 8085?
12. MOV A,M- How many number of T-states are required ?
13. Define instruction cycle, machine cycle and T-state .
14. What is an instruction?
15. What is the use of ALE ?
16. How many machine cycles does 8085 have, mention them .

17. Explain LDA, STA and POP instructions.
18. Explain the different instruction formats with examples .
19. Why do we use XRA A instruction ?
20. Why 8085 is called 8-bit microprocessor?

UNIT: 2

Introduction to Assembly Language Programming using Subroutine- CALL & RET instruction

Date: 25/8/15 Day 22: Tuesday, 11:40-12:30

CONTENTS

Assembly language programming using STACK

UNIT Objectives:

Broad Objectives of the chapter/topic are:

1. Capable of understanding the use of CALL/RET
2. Be able to write the simple programs
3. Timing diagram of CALL/RET.

Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):

1. Draw the timing diagram of CALL 9050H. [B.T Level 3]
2. Draw the timing diagram of RET. [B.T Level 3]

Remarks, if any

<p>UNIT: 2 Title : Subroutine-CALL/RET, nesting Date: 26/8/15 Day23: Thursday, 10:00-10:50</p>
<p>CONTENTS Conditional CALL/RET, Multiple ending, common ending & nesting subroutine</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. Differentiate between Multiple ending, common ending & nesting subroutine</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. . What are called nesting subroutine? [Level 3] 2. Define multiple ending subroutine. [Level 3]</p>
<p>Remarks, if any</p>

<p>UNIT: 2 Title : Subroutine Date: 27/8/15 Day24: Thursday, 15:50-16:40(Tutorial-6)</p>
<p>CONTENTS</p> <p>Subroutine</p> <p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. When a subroutine is called, the address of the instruction next to CALL instruction is stored Stack- explain. [Level 2] 2. What is meant by "subroutine"? Briefly discuss the sequence of events that takes place while executing CALL instruction. [Level 2]

<p>UNIT: 2 Title : Interrupts of 8085: software & hardware, Date: 31/8/15 Day25: Monday, 10:00-11:00</p>
<p>CONTENTS Interrupts of 8085,;software & hardware</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. To understand the Interrupts mechanism of 8085 2. To learn about the software & hardware Interrupts of 8085</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. What is an interrupt? Why it is used? [Level-2] 2. What are hardware interrupts of 8085? [Level-2] 3. What are software interrupts? [Level-2]</p>
<p>Remarks, if any</p>

<p>UNIT: 2 Title : Interrupts of 8085RIM & SIM, their uses. Date: 01/9/15 Day26: Tuesday, 11:40-12:30</p>
<p>CONTENTS Maskable interrupts, RIM & SIM, their uses</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. Understand the various properties Maskable interrupts, RIM & SIM, their uses</p>
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. List the maskable interrupts of 8085. [Level 2] 2. What are the difference between RIM & SIM? [Level 3]</p>
<p>Remarks, if any</p>

<p>UNIT: 2 Title : Serial data transfer using SID,SOD & RIM/SIM, I/O mapped I/O & memory mapped I/O, Date: 02/9/15 Day27: Wednesday, 10:50-11:40</p>
<p>CONTENTS Serial data transfer using SID,SOD & RIM/SIM, I/O mapped I/O & memory mapped I/O,</p>
<p>UNIT Objectives: Broad Objectives of the chapter/topic are: 1. To learn about the serial data communication 2. To memorize the difference between I/O mapped I/O & memory mapped I/O</p>

Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):
1. What is the difference between I/O mapped I/O & memory mapped I/O,? [Level 3]
2. How the serial data communication is achieved using SID,SOD & RIM/SIM? [Level 3]
Remarks, if any

UNIT: 2
Date: 3/9/15 Day28: Thursday, 15:50-16:40(Tutorial-7)
CONTENTS
Interrupts of 8085
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):
1. Write the instructios to set mask for the interrupts RST 5.5 & RST 6.5.
2.How can we know about the pending interrupts?
3. Explain RIM.
4. Give two difference between RIM & SIM.
5. What is the function of SOD & SID?
.

UNIT: 3
Title : Introduction to Programmable Peripheral Interfacing(PPI) using 8255, various operating modes : I/O and BSR,
Date: 7/9/15 Day29: Monday, 10:50-11:00
CONTENTS
Programmable Peripheral Interfacing(PPI) using 8255, various operating modes : I/O and BSR
UNIT Objectives:
Broad Objectives of the chapter/topic are:
1. Understand the use of PPI
2. Study 8255 as PPI with 8085
3. Memorize the different modes of 8255
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):
1. What is Programmable Peripheral Interfacing? [Level 3]
2. Draw & explain the internal architecture of 8255. [Level 3]
3. What are the different modes of 8255? [Level 3]
Remarks, if any

<p>UNIT: 3</p> <p>Title : mode-0,mode-1,mode-2 operations along with their control-word format</p> <p>Date: 8/9/15 Day30: Tuesday, 12:30-13:20</p>
<p>CONTENTS</p> <p>Different modes of 8255- mode-0,mode-1,mode-2 operations along with their control-word format</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the on Different modes of 8255 2. Study their control-word format
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What do you mean by Mode-0 operation of 8255? [L1] 2. Write short notes I/O mode of 8255. [L1]
<p>Remarks, if any</p>

<p>UNIT: 3</p> <p>Title : mode-0,mode-1,mode-2 operations along with their control-word format</p> <p>Date: 8/9/15 Day30: Tuesday, 12:30-13:20</p>
<p>CONTENTS</p> <p>Different modes of 8255- mode-0,mode-1,mode-2 operations along with their control-word format</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the on Different modes of 8255 2. Study their control-word format
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What do you mean by Mode-0 operation of 8255? [L1] 2. Write short notes I/O mode of 8255. [L1]
<p>Remarks, if any</p>

<p>UNIT: 3</p> <p>Title : mode-0,mode-1,mode-2 operations along with their control-word format</p> <p>Date: 8/9/15 Day30: Tuesday, 12:30-13:20</p>
<p>CONTENTS</p> <p>Different modes of 8255- mode-0,mode-1,mode-2 operations along with their control-word format</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the on Different modes of 8255 2. Study their control-word format
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What do you mean by Mode-0 operation of 8255? [L1]

2. Write short notes I/O mode of 8255. [L1]
Remarks, if any

UNIT: 3 Title : . Instructions: IN & Out, Assembly language programming using 8255 interfaced with 8085. Date: 9/9/15 Day31: Wednesday, 10:00-10:50
CONTENTS Different modes of 8255- mode-0,mode-1,mode-2 operations along Instructions: IN & Out, Assembly language programming using 8255 interfaced with 8085.
UNIT Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Know the instruction IN/OUT for Different modes of 8255 2. Study their Timing diagram
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom’s Taxonomy): <ol style="list-style-type: none"> 1. Which instructions are used to RD/WR I/O? [B.T Level 2] 2. Draw the timing diagram of IN 80H. [B.T Level 2]
Remarks, if any

UNIT:3
Title : Revision of : 8255 PPI
Date: 10/9/15 Day32: Thursday, 15:50-16:40 (Tutorial -8)
CONTENTS
Revision of : 8255 PPI
<ol style="list-style-type: none"> 1. What are the different modes of 8255? Explain. 2. Generate the control word format for the I/O mode operation of 8255. 3. Explain BSR mode of 8255. 4. Discuss bi-directional data transfer using 8255. 5. Write a program to set PC₄ and reset PC₇ using BSR mode of 8255. Assume the control register address is 83H

UNIT: 3
Title : Process of DMA, 8237- programmable DMA controller

Date: 14/9/15 Day33: Monday, 10:00-10:50
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the DMA operation in accordance with 8237/57 2. Study total DMA mechanism
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What do you mean DMA? How it can be achieved using 8237/57? [L3]
Remarks, if any

<p>UNIT: 3</p> <p style="text-align: center;">Title : Functions of 8259- programmable interrupt controller</p> <p>Date: 15/9/15 Day34: Tuesday, 11:40-12:30</p>
<p>CONTENTS</p> <p>Block diagram and operations of 8259- programmable interrupt controller</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the on Different parts of 8259 2. Study how it controls multiple interrupts
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. How many interrupts can be handled by 8259? [L3] 2. Write short notes 8259 as programmable DMA controller?. [L3]
Remarks, if any

<p>UNIT: 3</p> <p style="text-align: center;">Title : 8251-USART,</p> <p>Date: 16/9/15 Day35: Wednesday, 10:50-11:40</p>
<p>CONTENTS</p> <p>Different modes of operation of 8251</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the on Different modes of operation of 8251
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. Explain the operation of 8251. [L1]
Remarks, if any

UNIT-3
Date: 17/9/15 Day36: Thursday, 15:50-16:40(Tutorial-9)
CONTENTS

8257,8259,8251

Topic/Unit/Chapter Objectives:

Broad Objectives of the chapter/topic are:

1. Revision of **8257,8259,8251**

Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):

1. Write short notes on 8251-USART. [Level 3]
2. How many interrupts can be handled by 8259 at a time?

UNIT: 4	Title : 8086- introduction, architecture Date: 28/9/15 Day37: Monday, 10:00-10:50
CONTENTS	Architecture of 8086
UNIT Objectives:	Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Concept about 16-bit processor 2. Know the Architecture of 8086 3. Study the difference between 8085 & 8086 4. Memorize the different registers of 8086
	Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): <ol style="list-style-type: none"> 1. What do you mean by 16-bit microprocessor?[Level-3] 2. What is the function of BIU & EU? [Level-3] 3. Write short notes on- the register array of 8086.[Level3] 4. What are the flag registers of 8086? [Level3]
Remarks, if any	

UNIT: 4	Title : Addressing modes of 8086, segmentation & pipelining Date: 29/9/15 Day38: Tuesday, 11:40-12:30
CONTENTS	Different addressing modes of 8086 with examples ,Memory segmentation & pipelining, Different segment registers
UNIT Objectives:	Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Know the on Different modes of 8255 2. Study their control-word format
	Once the student has completed this topic/ chapter he/she will be able to answer following

<p>questions/perforM the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. How pipelining is achieved in 8086? [B.T Level 3] 2. How many segment registers are there in 8086? [B.T Level 3]
Remarks, if any

<p>UNIT: 4</p> <p style="text-align: center;">Title : Interrupts of 8086</p> <p>Date: 30/9/15 Day39: Wednesday, 10:50-11:00</p>
<p>CONTENTS</p> <p>Different interrupts of 8086 along with their mechanism</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Know the on Different interrupts of 8086 2. Study their mechanism
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perforM the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. What are the different interrupts of 8086? [Level-3] 2. Write short notes the interrupts of 8086. [L1]
Remarks, if any

<p style="text-align: center;">UNIT: 4</p> <p style="text-align: center;">Title : Revision</p> <p style="text-align: center;">Date: 1/10/15 Day40: Thursday, 15:50-16:40 (Tutorial-10)</p>
<p style="text-align: center;">CONTENTS</p>
<p>Revision: 8086</p>
<p>Topic/Unit/Chapter Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Assembly language programming on 8086
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perforM the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. Write the assembly language statement which will perform the following operations: <ol style="list-style-type: none"> i. Copy the BP register content into SP register. ii. Copy the contents of AX register to the DX register iii. Load the number F2H into AL register iv. Load the number 1456H into BP register

<p style="text-align: center;"><u>Assignment-2</u></p> <ol style="list-style-type: none"> 1. Write an ALP to find out the largest number from a given array of 10 numbers. 2. What is the difference between RIM and SIM instruction? 3. Discuss the BSR mode operation of 8255. 4. Write down the mode-0 control word for the following: Port A=input, port-b is not used, port c upper= input, Port c lower= output 5. Write a program to set PC₆ and reset PC₃ using BSR mode of 8255.

UNIT: 4	Title : Basic idea on PIC microcontroller
Date: 5/10/15	Day41: Monday, 10:00-10:50
CONTENTS	
UNIT Objectives:	
Broad Objectives of the chapter/topic are:	
<ol style="list-style-type: none"> 1. To understand the basics of PIC microcontroller 	
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):	
<ol style="list-style-type: none"> 1. What do you mean by PIC microcontroller? [L3] 2. How it differs from microprocessor?. [L2] 	
Remarks, if any	

UNIT: 4	Title : Introduction to 8051 microcontroller, pin description
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Date: 6/10/15 Day42: Tuesday, 11:40-12:30
CONTENTS Different pin description & their functions
UNIT Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Know the on functions of Different pins of 8051 2. Study their control-word format
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): <ol style="list-style-type: none"> 2. Write short notes on- PIC microcontroller. [L1]
Remarks, if any

UNIT: 6 Title : 8051-architecture, Assembly language programming of 8051 Date: 7/10/15 Day43: Wednesday, 10:50-11:00
CONTENTS 8051-architecture,SFR, DPTR, Assembly language programming of 8051
UNIT Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Know the architecture of 8051 2. Be able to write Assembly language programming of 8051
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): <ol style="list-style-type: none"> 1. Write an ALP for the addition of 2, 8-bit numbers using 8051. [L4]
Remarks, if any

UNIT-4
Title : 8051 microcontroller Date: 8/10/15 Day44: Thursday, 15:50-16:40 (Tutorial-11)
CONTENTS
Revision:8051 microcontroller- programming
Topic/Unit/Chapter Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1.Capable of understanding the need of 8051 microcontroller, , 2.Be able to understand the pin description of 8051. 3. Write the assembly language programming
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): <ol style="list-style-type: none"> 1. What are the major registers in 8051? [Level 3]

- 2. What is SFR? [Level 3]
- 3. Write an ALP for the division of 2, 8-bit numbers.[Level 3]
- 4.
- 4.
- 5.
- 6.

UNIT: 4	Title : Interrupts of 8051 Date: 13/10/15 Day45: Tuesday, 11:40-12:30
CONTENTS Different interrupts of 8051	
UNIT Objectives: Broad Objectives of the chapter/topic are: <ul style="list-style-type: none"> 1. Know the Different interrupts of 8051 2. Study their functions 	
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom’s Taxonomy): 1. What are the different interrupts of 8051? [L1]	
Remarks, if any	

UNIT: 4	Title : Assembly language programming of 8051 Date: 14/10/15 Day46: Wednesday, 11:40-12:30
CONTENTS Different instruction format & programming of 8051	
UNIT Objectives: Broad Objectives of the chapter/topic are: <ul style="list-style-type: none"> 1. Know the Different instructions of 8051 2. Study their applications 	
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom’s Taxonomy):	

1. Write
Remarks, if any

UNIT-4
Title : 8051 microcontroller
Date: 15/10/15 Day47: Thursday, 15:50-16:40 (Tutorial-12)
CONTENTS
8051 microcontroller- programming
Topic/Unit/Chapter Objectives: Broad Objectives of the chapter/topic are: 1.Capable of understanding the programming of 8051 microcontroller
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): <ol style="list-style-type: none"> 1. What are the major registers in 8051? [Level 3] 2. What is SFR? [Level 3] 3. Explain the different interrupts of 8051. [Level 4]

UNIT: 4
Title : Assembly language programming using 8085
Date: 28/10/15 Day48: Wednesday, 11:40-12:30
CONTENTS
Different programming on 8085
UNIT Objectives: Broad Objectives of the chapter/topic are: <ol style="list-style-type: none"> 1. Know the Different program techniques
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): <ol style="list-style-type: none"> 1. Write an ALP to find the largest number from a given sets of data. [Level-4] 2. Write an ALP to convert the binary numbers to ASCII. [Level-4]

Remarks, if any

UNIT-4 Title : 8085/86 programming Date: 29/10/15 Day49: Thursday, 15:50-16:40 (Tutorial-13)
CONTENTS
8085/86 - programming
Topic/Unit/Chapter Objectives: Broad Objectives of the chapter/topic are: 1.capable of understanding the different program methodology of 8085/86 2.be able to understand the interfacing techniques using 8255
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. Display the squarewave in CRO using BSR mode of 8255.[Level 4] 2. Write an ALP for the speed control of stepper motor. [Level 4]

UNIT: 5 Title : Revision on 8085 Date: 02/11/15 Day50: Monday, 10:00-10:50
CONTENTS Doubt clearing of previous topics from 8085, WBUT question paper discussion from 8085

<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Prepare them for university exam
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. 2.
<p>Remarks, if any</p>

<p>UNIT: 5</p> <p style="text-align: center;">Title : Revision on 8086</p> <p style="text-align: center;">Date: 3/11/15 Day51: Tuesday, 12:30-13:20</p>
<p>CONTENTS</p> <p>Doubt clearing of previous topics from 8086, WBUT question paper discussion from 8086</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Prepare them for university exam
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. 2.
<p>Remarks, if any</p>

<p>UNIT: 5</p> <p style="text-align: center;">Title : Revision on peripheral devices</p> <p style="text-align: center;">Date: 4/11/15 Day52: Wednesday, 11:40-12:30</p>
<p>CONTENTS</p> <p>Doubt clearing of previous topics from 8255/8237/8251/8259, WBUT question paper discussion from said devices</p>
<p>UNIT Objectives:</p> <p>Broad Objectives of the chapter/topic are:</p> <ol style="list-style-type: none"> 1. Prepare them for university exam
<p>Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy):</p> <ol style="list-style-type: none"> 1. 2.
<p>Remarks, if any</p>

<p>UNIT: 5</p> <p style="text-align: center;">Title : Revision on 8051</p> <p style="text-align: center;">Date: 5/11/15 Day53: Thursday, 15:50-16:40</p>
<p>CONTENTS</p> <p>Doubt clearing of previous topics from 8051, WBUT question paper discussion from 8051</p>
<p>UNIT Objectives:</p>

Broad Objectives of the chapter/topic are: 1. Prepare them for university exam
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. 2.
Remarks, if any

UNIT: 5 Title : Revision on programming of 8085/86/8051 Date: 5/11/15 Day54: Thursday, 15:50-16:40
CONTENTS Doubt clearing of 8085/86/8051, WBUT question paper discussion
UNIT Objectives: Broad Objectives of the chapter/topic are: 1. Prepare them for university exam
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. 2.
Remarks, if any

UNIT: 5 Title : Special classes for weaker students Date: 9/11/15 Day55 Monday, 10:00-10:50
CONTENTS: Total syllabus
UNIT Objectives: Broad Objectives of the chapter/topic are: 1. Prepare them for university exam
Once the student has completed this topic/ chapter he/she will be able to answer following questions/perform the following activities with Levels of Bloom's Taxonomy): 1. 2.
Remarks, if any

(x) Teaching Strategy/Method

- Assembly language programming
- 2. Interactive question-answer session
- 3. Arrangement of MCQ/quiz
- 4. Real life examples
- Learning by question answers
- projects & assignments
- 7. Group discussion

(xa) Strategy to support weak students

- Extra Doubt clearing session beyond class hour
- Assignment
- Weak students grouped with good students
- Viva after completion of each chapter
- Surprise Test
- Mentor to student meet
- Parent meet in connection with poor attendance & performance

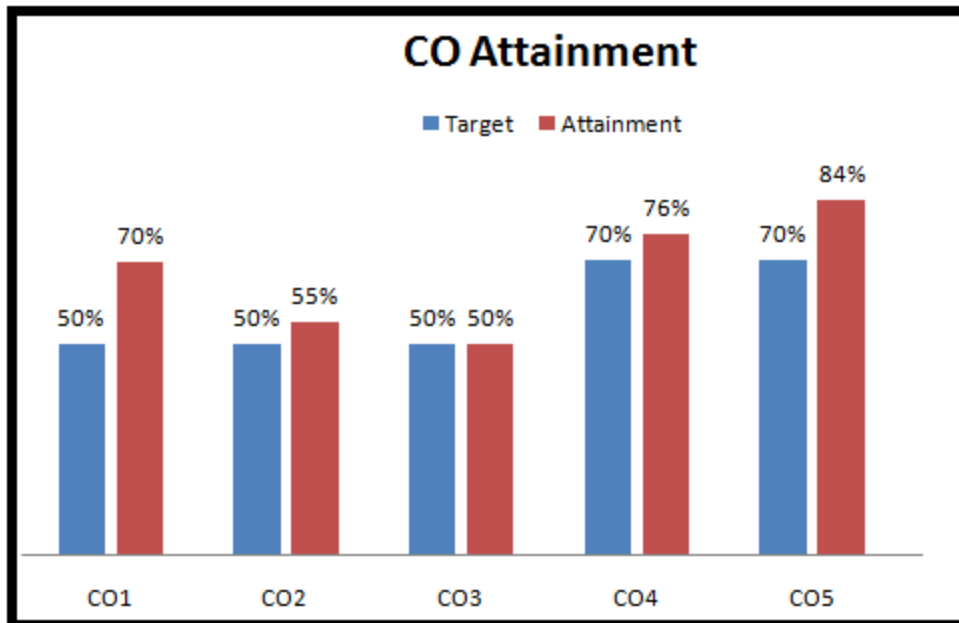
(xb) Strategy to encourage bright students

- High level assignment
- Award to good students
- Select bright student as Class Representative
- Motivate them for higher study/publication

(xc) Efforts to keep students engaged

- Asking students to share idea what they learned with fellow students.
- Small project
- Technical writing
- Library use
- Tutorial
- Model preparation for different Techfest

(xi) Analysis of Students performance in the course (Internal Results)



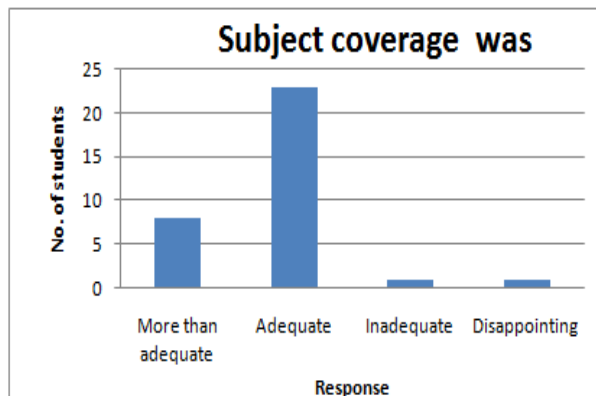
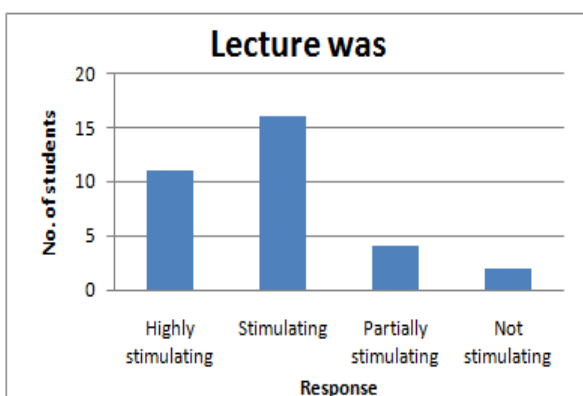
- 70% students have attained the set target of 50% marks for CO1
- 55% students have attained the set target of 50% marks for CO2
- 50% students have attained the set target of 50% marks for CO3
- 76% students have attained the set target of 70% marks for CO4
- 84% students have attained the set target of 70% marks for CO5

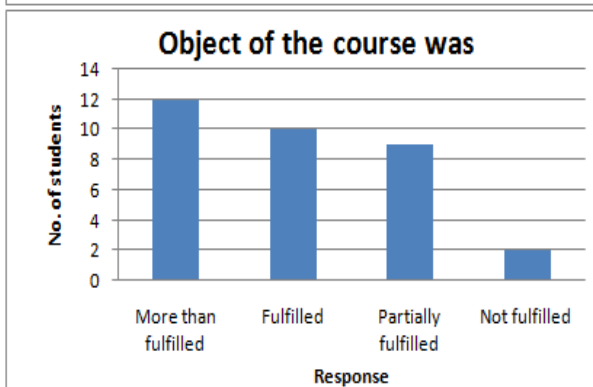
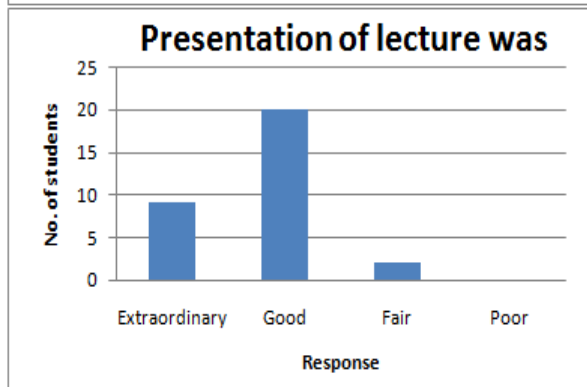
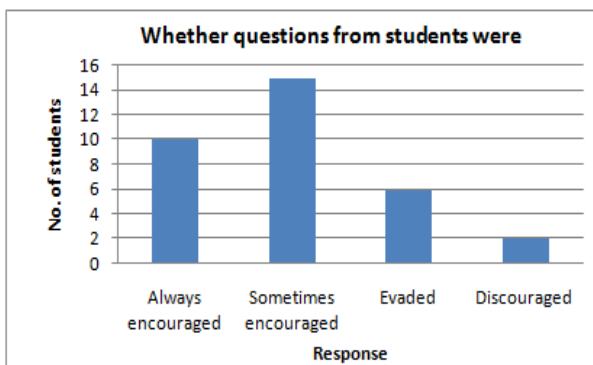
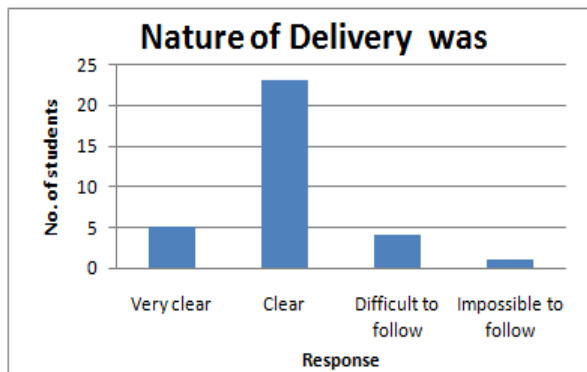
(xii) Analysis of Students performance in the course (University Results)

	Target Course Outcome%	TOTAL STUDENTS	TOTAL STUDENT WHO ATTAINED OUTCOME	% STUDENTS WHO ATTAINED THE OUTCOME
University	65%	38	33	87%

- 65% students have attained the set target of 50% marks for University Exams

(xiii) Analysis of Student Feed Back





(xiv) Teacher Self-Assessment (at the completion of course)

From the analysis of the results obtained it can be seen that set targets for the course outcome have been achieved successfully by the students. Since this subject will help them for designing systems based on 8085/86/8051, more emphasis must be given for developing theoretical concept and different programming techniques.

(xv) Recommendations/Suggestions for improvement by faculty

- More emphasis should be given to clear the concepts related to 8086/8051.
- MCQ/viva may be arranged after the completion of each module in the syllabus.

INTERNAL ASSESSMENT RECORD

Subject with code: Microprocessor & Microcontroller (CS-502) Semester : 5TH Sem, 2015

Discipline: COMPUTER SCIENCE & ENGINEERING

SL	Name	Roll No.	Attendance		Marks in Internal Test			Internal marks(15)	Assignmen t (=10)	Total (30)	Actual Int. Marks
			Total (%)	Marks (5)	I (30)	II (30)	Avg of 2 tests (30)				

1.	ABHISHEK DEY	11900113001	75	5	20	11	15.5	7.75	9	21.75	22
2.	ADITYA SAHA	11900113002	56	3	20	12	16	8	7	18	18
3.	AKANKSHA KUMARI	11900113003	84	5	16	17	16.5	8.25	9	22.25	23
4.	AKHILESH SINGH	11900113004	62	4	7	9	8	4	6	14	14
5.	AMIT KUMAR	11900113005	98	5	16	16	16	8	10	23	23
6.	AMRITA KUNDU	11900113007	56	5	16	18	17	8.5	8	21.5	22
7.	ANGSHUMAN HALDER	11900113008	67	4	17	8	12.5	6.25	8	18.25	19
8.	ANIRBAN DUTTA	11900113009	16	4	14	7	10.5	5.25	6	15.25	16
9.	ANKITA GUPTA	11900113011	42	5	17	18	17.5	8.75	6	23.75	24
10.	ANURAG SHARMA	11900113012	82	5	11	8	9.5	4.75	8	17.75	18
11.	AYUSH AMAN	11900113013	64	4	14	8	11	5.5	8	17.5	18
12.	BASANT RAJ	11900113014	87	2	9	10	9.5	4.75	10	16.75	17
13.	BHAWESH PRASAD	11900113016	84	3	15	13	14	7	9	19	19
14.	BINITA AGARWAL	11900113017	76	3	19	14	16.5	8.25	7	19.25	20
15.	BISWAJIT DOLUI	11900113018	98	3	11	17	14	7	7	17	17
16.	CHIRANJIB MUKHERJEE	11900113019	87	5	13	17	15	7.5	6	18.5	19
17.	GANESH CHANDRA SAHA	11900113020	64	4	11	13	12	6	7	17	17
18.	JAYDEET KARMAKAR	11900113021	76	5	20	20	20	10	7	22	22
19.	JUHI RANI	11900113022	60	5	25	22	23.5	11.75	8	26.75	27
20.	JYOTI SINHA	11900113023	58	5	15	22	18.5	9.25	7	23.25	24
21.	KARISHMA KUMARI	11900113024	51	5	11	27	19	9.5	6	24.5	25
22.	KRIKA BIBHU	11900113025	78	5	20	28	24	12	8	27	27
23.	KUMAR NISHANT	11900113026	33	1	12	7	9.5	4.75	5	10.75	11
24.	KUNAL KUMAR	11900113027	84	2	8	9	8.5	4.25	6	12.25	13
25.	MILAN SHIT	11900113028	76	2	7	13	10	5	10	17	17
26.	MOHAMMAD MAYAR ALAM	11900113030	24	1	0	15	7.5	3.75	6	10.75	11

27.	MONALISA SINHA	11900113031	60	4	10	13	11.5	5.75	7	18.75	19
28.	MRINAL BARMAN	11900113032	62	3	7	7	7	3.5	7	13.5	14
29.	NEHA GOYAL	11900113033	71	4	18	9	13.5	6.75	8	19.75	20
30.	NEHA SINGH	11900113034	64	2	17	10	13.5	6.75	7	15.75	16
31.	NIRAJ SONAR	11900113035	58	1	8	13	10.5	5.25	6	12.25	13
32.	PRABHAKAR PAUL	11900113036	64	4	8	9	8.5	4.25	8	16.25	15
33.	PRAGYA KUMARI	11900113037	64	4	16	12	14	7	6	17	18
34.	PRASANJIT BANIK	11900113038	64	4	12	15	13.5	6.75	7	17.75	18
35.	PRITAM KUMAR GHOSH	11900113039	64	4	15	11	13	6.5	6	16.5	17
36.	PRITI KUMARI	11900113040	64	4	14	13	13.5	6.75	6	16.75	17
37.	PRIYANKA KUMARI	11900113041	64	4	17	8	12.5	6.25	6	16.25	17
38.	PRONIL CHAKRABORTY	11900113042	64	4	10	16	13	6.5	6	16.5	17

ATTENDANCE SHEET (Practical)

Subject with code: Microprocessor & MicrocontrollerLab (CS-592)

Semester : 5TH Sem, 2015

Discipline: COMPUTER SCIENCE & ENGINEERING

S L	Name	Roll No.	1	2	3	4	5	6	7	8	9	10	TOTAL
			31/7/15	7/8/15	2/8/15	28/8/15	4/9/15	11/9/15	18/9/15	7/11/15			
1.	ABHISHEK DEY	11900113001	0	1	1	1	1	1	1	1			7
2.	ADITYA SAHA	11900113002	0	1	1	1	1	1	1	1			7
3.	AKANKSHA KUMARI	11900113003	1	1	1	1	1	1	1	1			8
4.	AKHILESH SINGH	11900113004	0	1	1	1	1	1	1	1			7
5.	AMIT KUMAR	11900113005	1	1	1	1	0	1	1	1			7
6.	AMRITA KUNDU	11900113007	1	1	1	1	1	1	1	1			8

ATTENDANCE SHEET (Practical)

Subject with code: Microprocessor & Microcontroller Lab (CS-592)

Semester : 5TH Sem, 2015

Discipline: COMPUTER SCIENCE & ENGINEERING

SL	Name	Roll No.	1	2	3	4	5	6	7	8	9	10	TOTAL
			1/8/ 15	12/ 9/1 5	3/1 0/1 5	7/1 1/1 5							
20.	JYOTI SINHA	11900113023	2	2	2	2							8
21.	KARISHMA KUMRI	11900113024	2	2	2	2							8
22.	KRITIKA BIBHU	11900113025	2	2	2	2							8
23.	KUMAR NISHANT	11900113026	2	2	2	2							8
24.	KUNAL KUMAR	11900113027	2	2	2	2							8
25.	MILAN SHIT	11900113028	2	2	2	2							8
26.	MOHAMMA D MAYAR ALAM	11900113030	2	2	2	2							8
27.	MONALISA SINHA	11900113031	2	2	2	2							8
28.	MRINAL BARMAN	11900113032	2	2	0	2							6
29.	NEHA GOYAL	11900113033	2	2	2	2							8
30.	NEHA SINGH	11900113034	2	2	2	2							8
31.	NIRAJ	11900113035	2	0	2	2							6

	SONAR												
32.	PRABHAKAR PAUL	11900113036	2	2	2	2							8
33.	PRAGYA KUMARI	11900113037	2	2	2	2							8
34.	PRASANJIT BANIK	11900113038	2	2	2	2							8
35.	PRITAM KUMAR GHOSH	11900113039	2	2	2	2							8
36.	PRITI KUMARI	11900113040	2	2	2	2							8
37.	PRIYANKA KUMARI	11900113041	0	2	2	2							6
38.	PRONIL CHAKRABORTY	11900113042	2	2	2	2							8

Records of Assignment / Quiz
Subject with code: Microprocessor & Microcontroller
(CS-502)
Semester : 5TH Sem, 2015
Discipline: COMPUTER SCIENCE & ENGINEERING

SL	Name	Roll No.	Assgn. 1	Assgn. 2
1.	ABHISHEK DEY	11900113001	1	1
2.	ADITYA SAHA	11900113002	1	1
3.	AKANKSHA KUMARI	11900113003	1	1
4.	AKHILESH SINGH	11900113004	1	1
5.	AMIT KUMAR	11900113005	1	1

6.	AMRITA KUNDU	11900113007	1	1
7.	ANGSHUMAN HALDER	11900113008	1	1
8.	ANIRBAN DUTTA	11900113009	1	1
9.	ANKITA GUPTA	11900113011	1	1
10.	ANURAG SHARMA	11900113012	1	1
11.	AYUSH AMAN	11900113013	1	1
12.	BASANT RAJ	11900113014	1	1
13.	BHAWESH PRASAD	11900113016	1	1
14.	BINITA AGARWAL	11900113017	1	1
15.	BISWAJIT DOLUI	11900113018	1	1
16.	CHIRANJIB MUKHERJEE	11900113019	1	1
17.	GANESH CHANDRA SAHA	11900113020	1	1
18.	JAYDEET KARMAKAR	11900113021	1	1
19.	JUHI RANI	11900113022	1	1
20.	JYOTI SINHA	11900113023	1	1
21.	KARISHMA KUMARI	11900113024	1	1
22.	KRITIKA BIBHU	11900113025	1	1
23.	KUMAR NISHANT	11900113026	1	1
24.	KUNAL KUMAR	11900113027	1	1
25.	MILAN SHIT	11900113028	1	1
26.	MOHAMMAD MAYAR ALAM	11900113030	1	1
27.	MONALISA SINHA	11900113031	1	1
28.	MRINAL BARMAN	11900113032	1	1
29.	NEHA GOYAL	11900113033	1	1
30.	NEHA SINGH	11900113034	1	1
31.	NIRAJ SONAR	11900113035	1	1
32.	PRABHAKAR PAUL	11900113036	1	1
33.	PRAGYA KUMARI	11900113037	1	1
34.	PRASANJIT BANIK	11900113038	1	1
35.	PRITAM KUMAR GHOSH	11900113039	1	1

36.	PRITI KUMARI	11900113040	1	1
37.	PRIYANKA KUMARI	11900113041	1	1
38.	PRONIL CHAKRABORTY	11900113042	1	1

<p style="text-align: center;">LIST OF PRACTICALS Subject with code: Microprocessor & Microcontroller Lab (CS-592) Semester : 5TH Sem, 2015 Discipline: COMPUTER SCIENCE & ENGINEERING</p>		
Sl.	Details of Experiment(s)	Hours allotted
P1.	Study of prewritten programs on 8085 trainer kit using the basic instruction set (data transfer, load/store, arithmetic, logical).	3 hr
P2.	<u>To perform the programs on 8085 trainer kit:</u> 1. Write a program to add 2, 8 bit data stored in internal registers. 2. Write a program to subtract 2, 8 bit data stored in internal registers. 3. Write a program to add 2, 8 bit data after storing it two consecutive memory location and store the output in the next location. 4. Store any 8 bit data in register D and another data in 8000H memory location. Subtract the data of memory from the data of register and store the output in 8002H memory location.	3 hr
P3.	<u>To perform the programs on 8085 trainer kit :</u> 1. Write a program add to 16 bit data using DAD instruction. 2. Write a program add to 16 bit data using without DAD instruction. 3. Write a program to add n natural nos. 4. Write a program n natural nos. after storing it in consecutive memory location.	3 hr
P4.	<u>To perform the programs on 8085 trainer kit :</u> 1. Write a program to multiply 2, 8 bit data. 2. Write a program to divide 2, 8 bit data. 3. Write a program to copy a block of memory and shift it into another memory location. 4. Write a program to add n even/odd data stored in consecutive memory location.	3 hr
P5.	<u>To perform the programs on 8085 trainer kit :</u> 1. Write a program to add n BCD nos. 2. Write a program to arrange a set of data in ascending/ descending order in consecutive memory location. 3. Write a program to pack 2 BCD nos. 4. Write a program to unpack 2 BCD nos.	3 hr
P6.	<u>To perform the programs on 8085 trainer kit :</u> 1. Write a program to search a particular data in a set of data store in consecutive memory location (table look up). 2. Write a program to check whether two set of data in memory are match or not (string matching). 3. Write a program to convert BCD no. into binary no. 4. Write a program to convert binary no. to BCD no.	3 hr
P7.	<u>To perform the programs on 8085 trainer kit :</u> 1. Write a program to add n 16 bit data. 2. Write a program to convert any hexadecimal no. into ASCII no.	3 hr

	3. Write a program to convert any binary no. into ASCII no. 4. Write a program to convert any ASCII no. into binary no.	
P8.	To perform the programs on 8085 trainer kit : 1. Write a program to ON LED's after reading the status of its switch. 2. Write a program to ON all LED's at the same time. 3. Write a program to ON all the LED's one by one with particular delay. 4. Write a program to display a square/rectangular wave in CRO.	3 hr
P9.	Familiarization with 8051 microcontroller kit and perform the programs in it : 1. Write a program to add 2, 8 bit data stored in registers. 2. Write a program to subtract 2, 8 bit data stored in registers.	3 hr
P10.	To perform the programs on 8051 trainer kit : 1. Write a program to multiply 2, 8 bit data stored in registers. 2. Write a program to divide 2, 8 bit data stored in registers. 3. Serial communication between 2 8085 trainer kit.	3 hr
P11.	Revision (on the programming of 8085)	3 hr
P12.	Revision (on the programming of 8051)	3 hr

Sessional/Practical Performance Record

Subject with code: Microprocessor & Microcontroller Lab (CS-592)

Semester : 5TH Sem, 2015

Discipline: COMPUTER SCIENCE & ENGINEERING

SI	Name	Roll No.	Marks in experimentation										Total (40)
			1	2	3	4	5	6	7	8	9	10	
1.	ABHISHEK DEY	11900113001	0	4	4	3	4	3	3	4			25
2.	ADITYA SAHA	11900113002	0	4	4	4	4	4	4	4			28
3.	AKANKSHA KUMARI	11900113003	0	4	4	3	4	3	3	4			25
4.	AKHILESH SINGH	11900113004	2	3	2	3	2	3	2	3			20
5.	AMIT KUMAR	11900113005	4	4	4	0	4	4	4	4			28
6.	AMRITA KUNDU	11900113007	4	4	4	4	4	4	4	2			30
7.	ANGSHUMAN HALDER	11900113008	4	4	4	4	4	4	4	4			32
8.	ANIRBAN DUTTA	11900113009	3	1	2	3	4	4	1	2			20
9.	ANKITA GUPTA	11900113011	2	4	2	4	2	2	2	1			19
10.	ANURAG SHARMA	11900113012	4	4	4	4	4	3	3	3			29
11.	AYUSH AMAN	11900113013	4	4	4	4	4	4	4	4			32
12.	BASANT RAJ	11900113014	0	4	3	3	0	3	3	4			29

35.	PRITAM KUMAR GHOSH	11900113039	8	8	8	8								32
36.	PRITI KUMARI	11900113040	8	6	6	8								28
37.	PRIYANKA KUMARI	11900113041	0	8	8	8								24
38.	PRONIL CHAKRABORTY	11900113042	8	6	6	8								28

NAME WITH ROLL Nos. OF STUDENT WHOSE ACADEMIC PERFORMANCE IS NOT SATISFACTORY

Sl.	Roll No.	Name of Student	Remedial measures taken by teacher
1	11900113004	AKHILESH SINGH	<ul style="list-style-type: none"> • Preparing them by solving previous year WBUT question papers • Additional doubt clearing sessions • Providing extra assignments • Highlighting important and frequently asked questions
2	11900113014	BASANT RAJ	
3	11900113027	KUNAL KUMAR	
4	11900113028	MILAN SHIT	
5	11900113030	MOHAMMAD MAYAR ALAM	
6	11900113035	NIRAJ SONAR	

CERTIFICATE

I, the undersigned, have completed the course allotted to me as shown below:

Sl. No.	Semester	Subject with Code	Total Units	Remarks
1.	5 TH	1. Microprocessor & Microcontroller (CS-502) 2. Microprocessor & Microcontroller Lab (CS-592)	04	

Date :

Signature of Faculty

Submitted to HOD

Certificate by HOD

I, the undersigned, certify that **Prof. SARMISTHA MONDAL** has completed the course work allotted to him satisfactorily / not satisfactorily.

Date :

Signature of HOD

Submitted to Director

Date :

Signature of Director