Practical Problem

Integrated M.Sc. (IT) 3rd semester :: EC4008 – Microprocessor Programming and Interfacing

Practical No: 1	**Enrollment No:**	**Name:**
Practical Problem	**(a) Study of Binary, Octal, Decimal and Hex numbering systems.** **(b) Study of 8086 Microprocessor Architecture.** **(c) Study of 8086 Microprocessor Instruction Set.** **(d) Study of debug utility of 32-bit architecture processor.** **(e) Assembling, editing, linking, and executing Assembly code examples using EMU8086 and Debug utility.**	
Objective(s)	✓ To get familiar with internal architecture of 8086 & hardware. ✓ To have depth understanding of 8086 Instructions & its types. ✓ To get familiar with tools which are to be used in laboratory for Assembly language programming	
Pre-requisite	Basic knowledge of Computer organization	
Duration for completion	6 hours	
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.	
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development	
CO(s) to be achieved	CO1 - Recognize architecture of 8086 processor; differentiate among Mainframe, Minicomputer & Microprocessor. CO3 - Describe assembler directives, macros & procedures. CO4 - Illustrate interfacing of memory with microprocessor. CO5 - Identify 8086 interrupts & utilize it in assembly language programming.	
Solution must contain	✓ Block diagram, Pin diagram of 8086 microprocessor & its description.(for a) ✓ Instruction syntax, description & example. ✓ Abstract description about MASM & its commands, description of EMU 8086 & commands. ✓ Snapshot of emu8086 and debug utility	
Nature of submission	Handwritten	
References for solving the problem	• Search on Internet • Douglas V Hall, Microprocessors & Interfacing, TMH	
Sample Testing data and outcome	NA	
Post Laboratory questions	*1.* Why 8086 is known as 16-bit microprocessor? *2.* How many Address pins are there with 8086 processor? *3.* How many segment registers are there? *4.* What is the size of data bus? *5.* What are different types of instructions available in 8086? *6.* What is the purpose of XCHG instruction? *7.* List different branching & control instructions. *8.* What is REP prefix? *9.* What is the command used to compile assembly language program? *10.* How we can convert base of a number using EMU8086? *11.* Which version of EMU8086 is installed in Lab?	

Assessment

	Solution achieves the desired objective(s)	**Viva**
Out of Marks	**10**	**5**
Secured by the student		
Signature and Date		

Practical Problem

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Practical No: 2	**Enrollment No:**	**Name:**
Practical Problem	**(a) Write Assembly Program(WAP) to add first ten decimal numbers. (no loops).** **(b) WAP to do block transfer without overlap (16 bit as well as 8 bit).** **(c) WAP to do block transfer with overlap (16 bit as well as 8 bit).** **(d) WAP to do block exchange (16 bit as well as 8 bit).** **(e) WAP to do 16 bit and 32 bit addition and subtraction.** **(f) WAP to do 16 bit and 32 bit multiplication.** **(g) WAP to do 16 bit division.** **(h) WAP to find cube of a byte.** **(i) WAP to find square of a word.**	
Objective(s)	To get familiar with Arithmetic Instructions of 8086 & usage of different directives.	
Pre-requisite	Familiarity with emu8086	
Duration for completion	4 hour	
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.	
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development	
CO(s) to be achieved	CO2 - Construct Instructions for 8086 processor & develop assembly language programs.	
Solution must contain	✓ Sample calculation ✓ Tracing of program (only for important part of source code) ✓ Source code ✓ Output	
Nature of submission	Handwritten	
References for solving the problem	--	
Sample Testing data and outcome	--	
Post Laboratory questions	1. What are the different arithmetic instructions? 2. Which register will hold result of arithmetic operation is stored? 3. How you can declare Data segment? 4. Which directive is used to declare code segment? 5. Is there any other way to multiply numbers without using MUL instruction? 6. Can we use same program to multiply two 8 bit numbers? 7. Is it possible to multiply BCD numbers using MUL instruction? 8. What are different ways to define data items? 9. How can we define array in data segment? 10. How we can initialize DS by data segments base address? 11. Is any special symbol required to terminate list of numbers in DS? 12. What are different ways to define data items? 13. How can we define array in data segment? 14. How we can initialize DS by data segments base address?	

Assessment

	Solution achieves the desired objective(s)	**Viva**
Out of Marks	**10**	**5**
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Signature and Date		

Practical Problem

Integrated M.Sc. (IT) 3rd semester :: EC4008 – Microprocessor Programming and Interfacing

Practical No: 3	**Enrollment No:**	**Name:**
Practical Problem	**(a) WAP to find factorial of number.** **(b) WAP to test simple procedure in 8086.** **(c) WAP to check if the data is positive or negative.** **(d) WAP to check if the data is odd or even.** **(e) WAP to check the given number is bit wise palindrome or not.** **(f) WAP to count number of 1's and 0's in given number.** **(g) WAP to compare three numbers & print message on the display accordingly.** **(h) WAP to accept 1 number from keyboard and print it with its squares.** **(i) WAP for addition/subtraction of array.** **(j) WAP to find largest/smallest element in array.** **(k) WAP for sorting an array.**	
Objective(s)	To get familiar with writing looping programs of 8086.	
Pre-requisite	Familiarity with emu8086	
Duration for completion	6 hours	
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.	
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development	
CO(s) to be achieved	CO2 - Construct Instructions for 8086 processor & develop assembly language programs.	
Solution must contain	✓ Description of instructions and flags ✓ Tracing of program (only for important part of source code) ✓ Source code ✓ Output	
Nature of submission	Handwritten	
References for solving the problem	--	
Sample Testing data and outcome	--	
Post Laboratory questions	1. Which instructions are used for arithmetic operations in 8086? 2. What happen if result does not fit in 16 bit register? 3. Is any special symbol required to terminate list of numbers in DS?	

Assessment

	Solution achieves the desired objective(s)	**Viva**
Out of Marks	**10**	**5**
Secured by the student		
Signature and Date		

Practical Problem

Integrated M.Sc. (IT) 3rd semester :: EC4008 – Microprocessor Programming and Interfacing

Practical No: 4	**Enrollment No:**	**Name:**
Practical Problem	**(a) WAP to display string " BMIIT" on monitor.** **(b) WAP for string transfer.** Example: str1 = 'BMIIT' and str2 = '' then after program get executed str1='BMIIT' and str2='BMIIT'. **(c) WAP for string reverse.** Example: str1 = 'BMIIT' then after program get executed str1='TIIMB'. **(d) WAP to do character search in a string.** Example: str1 = 'BMIIT' and if user enters 'I' then output will be I comes 2 times and if user enters 'A' then output will be 'Character not available'. **(e) WAP to check whether the given string is palindrome or not.** Example: str1 = 'TIAIT' then output will be ' String is palindrome'. **(f) WAP to count number of vowels in a given string.** Example: str1 = 'BMIIT' then output will be 'number of vowels are 2'. **(g) WAP which will input the user name from the keyboard. If the user is "Sapan" it will output "The username is valid" else it will output "Invalid user name".** **(h) WAP which will convert occurrence of every lowercase letter to its corresponding uppercase letter in a given string. (Use logical instructions)**	
Objective(s)	To get familiar with string instructions of 8086.	
Pre-requisite	Familiarity with emu8086	
Duration for completion	6 hours	
PEO(s) to be achieved	PEO2: To provide quality practical skill of tools and technologies to solve industry problems.	
PO(s) to be achieved	PO6: Ability to use the techniques, skills and modern tools as necessary for software development	
CO(s) to be achieved	CO2 - Construct Instructions for 8086 processor & develop assembly language programs.	
Solution must contain	Source Code & Output	
Nature of submission	Handwritten	
References for solving the problem	--	
Sample Testing data and outcome	--	
Post Laboratory questions	1. Which instructions are used for string operations in 8086? 2. Which registers are used generally for string manipulation operations? 3. Compare string manipulation operations in the context of assembly language programming and higher language programming.	

Assessment

	Solution achieves the desired objective(s)	**Viva**
Out of Marks	**10**	**5**
Secured by the student		
Signature and Date		