Enrolment No._____

NATIONAL FORENSIC SCIENCES UNIVERSITY, DELHI CAMPUS
B.Tech. - M.Tech. CS Integrated-Sem IV, February 2023
Term Assessment – 1

Subject Code: CTMTCSE SIV P3 **Date:**
Subject Name: Microprocessor & Microcontroller **Time: 45 minutes**
Total Marks: 25

Instructions:

1. This Question Paper consists of 4 Questions.
2. All the questions are compulsory.

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1. Explain the control flags of 8086 microprocessor. (6)

2. Find out the state of conditional flags of the 8086 microprocessor after execution of following arithmetic operation
   (a) 4FH + 48H (using 8-bit operation)
   (b) FFFFH + 0001H (using 16-bit operation)
   (c) F5H-3FH (using 8-bit operation) (3+3+3)

3. Derive the logical expression of control signal for following operations in 8086 microprocessor
   (a) Memory read operation
   (b) Memory write operation (3+3)

4. Explain general purpose registers of 8086 microprocessor. (4)

OR

What is stack pointer and what is the need of stack?

END OF PAPER

Enrolment No. 102GTBMCS[redacted]

NATIONAL FORENSIC SCIENCES UNIVERSITY, DELHI CAMPUS
B.Tech. - M.Tech. CS Integrated-Sem IV, April 2023
Mid Semester Examination

Subject Code: CTMTCSE SIV P3
Subject Name: Microprocessor & Microcontroller

Date: 19/04/2023
Time: 1 Hr 30 Min
Total Marks: 50

Instructions:
1. This Question Paper consists of 7 Questions.
2. All the questions are compulsory.

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1. What do you mean by addressing modes? What are the different addressing modes supported by 8086? Explain each of them with suitable examples. 5M
2. What are the different instruction types of 8086? 5M
3. Draw the register organization of 8086 and explain typical applications of each register. 5M
4. Draw and discuss flag register of 8086 in brief. 5M
5. Explain the physical memory organization in an 8086 system. 5M

OR

Explain the concept of segmented memory? What are its advantages? How the physical address is computed in 8086 for different segments of memory?

6. Answer the following questions in short **(any five)**: 5M
   i. What is the range of physical address if CS=FF59H?
   ii. Which register(s) are used to access the stack?
   iii. If control is transferred outside the current code segment, is it NEAR or FAR?
   iv. In unsigned multiplication of AX with BX, in which register(s), the product is placed in?
   v. To set all bits of an operand to 1, it could be ORed with ---------.
   vi. To set all bits of an operand to 0, it could be ANDed with ---------.
7. Explain the following instructions of 8086 with suitable examples **(any ten)** 10 × 2M

i.	MOV	ii.	PUSH	iii.	POPF	iv.	ADD
v.	MUL	vi.	DIV	vii.	CMP	viii.	DAA
ix.	AND	x.	RCL	xi.	JMP	xii.	JB/JC/JNAE

END OF PAPER

Seat No. [redacted] Enrolment No. 102C7BMC[redacted]

NATIONAL FORENSIC SCIENCES UNIVERSITY

B.Tech - M.Tech. Computer Science and Engineering
(Cyber Security) - Semester - IV – July -2023

Subject Code: CTBTCSE SIV P3 **Date: 05/07/2023**
Subject Name: Microprocessor & Microcontroller
Time: 11.00 am to 2.00 pm **Total Marks: 100**

Instructions:

1. **Write down each question on separate page.**
2. **Attempt all questions.**
3. **Make suitable assumptions wherever necessary.**
4. **Figures to the right indicate full marks.**

			Marks
Q.1	(a)	Enumerate features of Intel 8051 microcontroller in detail.	05
	(b)	Differentiate between Microprocessor & Microcontroller.	05
	(c)	Draw the block diagram of 8051 microcontroller and explain each block in detail.	07
Q.2	(a)	What do you mean by Addressing modes? Explain each addressing mode of 8051 microcontroller in detail with suitable example.	05
	(b)	Draw the bit pattern of Flag register of 8086 microprocessor and explain each flag in detail.	05
	(c)	Explain bit pattern of TMOD register of 8051 microcontroller in detail. Also explain Mode 1 & Mode 2 timer operation in detail.	07
		OR	
	(c)	Write a program to generate a square wave of 50Hz frequency at P2.0 of 8051 microcontroller using timers. Assume suitable crystal frequency.	07
Q.3	(a)	Draw and explain block diagram of 8086 microprocessor in detail.	08
	(b)	Write a program to make addition of three data (9CH, 84H & ABH) in 8086 microprocessor and store result in DX register. Also store the result at 5000H memory location. Write status of CY & P flags at the end the program.	08
		OR	
	(b)	Write a program to move a data block of 5 data stored in data segment to extra segment of 8086 microprocessor.	08
Q.4	(a)	What will be status of **CY, P & S** flag, when following instructions are executed in 8086 microprocessor? **(Assume, AL = 80H, BL = 80H, CX=0005H)** (i) SUB AL,BL (ii) REPEAT: ADD AL,BL	05

		LOOP REPEAT (iii) XOR AL,BL	
	(b)	Explain, how effective address / physical address can be calculated in 8086 microprocessor for code segment? If CS = 0200H & IP = 0050H, then what will be effective address?	05
	(c)	What do you mean by Stack memory? Explain instructions used to access stack memory with example.	07
Q.5	(a)	Explain following assembler directives with suitable example: (i) SEGMENT (ii) OFFSET (iii) EQU	05
	(b)	What do you mean by subroutine? Explain CALL & RET instructions with appropriate example.	05
	(c)	Explain following string instructions in 8086 microprocessor with suitable example: MOVSB, CMPSB, SCASB.	07
		OR	
	(c)	Write a program for 8086 microprocessor to find maximum number from a block of 5 data stored in data segment. Store result at the end of the block.	07
Q.6	(a)	Write features of ARM7TDMI in detail.	08
	(b)	Compare ARM Cortex M, Cortex R & Cortex A series of microcontrollers.	08
		OR	
	(b)	Explain architecture of ARM processor with necessary diagram.	08

END OF PAPER

Seat No [redacted] Enrolment No. 102CTBMCS[redacted]

NATIONAL FORENSIC SCIENCES UNIVERSITY

(Delhi Campus)

B.Tech-M.Tech CSE (Cyber Security) - Semester – IV, July – 2023

Subject Code: CTBTCSE SIV L2 **Date: 19/07/2023**

Subject Name: Microprocessor & Microcontroller Lab

Time: 2:30 PM to 05:30 PM **Total Marks: 80**

PART A

Attempt any three questions (Theoretical study).

		Marks
Q.1	How effective address can be calculated for different segments in 8086 microprocessor? Explain with suitable example.	20
Q.2	Explain addressing modes of 8086 microprocessor with appropriate examples.	20
Q.3	What do you mean by assembler directives? Explain any five assembler directives with suitable example.	20
Q.4	Draw and explain flag register of 8086 microprocessor in detail.	20

PART B

Attempt the marked question.

1. Write a program to find out the number of even and odd numbers from a given series of 16-bit hexadecimal numbers.
2. Write a program to find out the number of positive numbers and negative numbers from a given series of signed numbers.
3. Write a program to find out largest no from an unordered array of sixteen 8-bit numbers stored sequentially in the memory location starting at offset 0500H in the segment 2000H.
4. Write a program for the addition of a series of 8-bit numbers. The series contains 15 numbers.

5. Write a code to find the Fibonacci series.
6. Write a program to find out the average of 10 numbers.
7. Write a program to reverse the given string and store at the same locations.
8. Write a program using the LOOP instruction with indirect addressing that copies a string from source to target, reversing the character order in the process.
9. Write a program that finds the number of 1's in a byte.
10. Write a program that finds the number of 1's in a word. Provide the count in BCD.
11. Decide whether the parity of a given number is even or odd. If parity is even set DL to 00; else set DL to 01. The given number may be a multibyte number.
12. Write a program to add two multibyte numbers and store the result as a third number. The numbers are stored in the form of the byte lists stored with the lowest byte first.