Code No: R203204J **R20** SET -1

III B. Tech II Semester Regular Examinations, July -2023
FUNDAMENTALS OF MICROPROCESSORS AND MICROCONTROLLERS
(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) Define Micro processor and with a neat sketch explain the 8085 Processor Hardware Architecture. [7M]
   b) Explain about Minimum mode operation of 8086 processor. [7M]

(OR)

2. a) Explain about general bus operation of 8086 micro processor. [7M]
   b) Define Interrupt, Enlist the different types of Interrupts of 8085 processor. [7M]

UNIT-II

3. a) Write an assembly level language programme to find the sum of even numbers between1 to 100. [7M]
   b) Interface two chips of 32KX8 ROM and four chips of 32K X 8 RAM with 8086 microprocessor connecting ROMs between F0000H and FFFFFH locations; RAMs between D0000H and EFFFFH locations. Show the implementation of this memory system [7M]

(OR)

4. a) Write an assembly language program in 8086 to find the factorial of a given number. [7M]
   b) Write a program which adds a byte number from one memory location to a byte from the next memory location , store the sum in a third memory location and state of the carry flag in the least significant bit of a fourth memory location. Mask the upper 7 bits of the memory location where the carry is stored. [7M]

UNIT-III

5. a) Explain various different control word formats of 8255 PPI. [7M]
   b) Explain about Pin diagram of 8259 with a neat sketch. [7M]

(OR)

6. a) With a neat sketch explain about USART Interfacing. [7M]
   b) Explain in detail about Operating modes of 8257. [7M]

UNIT-IV

7. a) Write 8051 program to generate 2 KHz square waves on pin P1.0 of port 1 using Timer interrupt. [7M]
   b) Write an assembly language program in 8051 to sort the given numbers in ascending order [7M]

(OR)

8. a) Describe the four modes in which 8051 serial port can be configured. [7M]
   b) Explain the arithmetic instructions of 8051 with examples. [7M]

UNIT-V

9. a) With a neat sketch, Explain about LCD interfacing with 8051. [7M]
   b) Discuss the Keyboard interfacing with 8051 with an example. [7M]

(OR)

10. a) Write an 8051 subroutine to control the 7-segment display operation. [7M]
    b) Explain about Control of servo motor with a neat sketch. [7M]

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Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each unit
All Questions Carry Equal Marks
*****

UNIT-I

1.	a)	Explain about different Functional Building Blocks of 8085 Processor.	[7M]
	b)	Explain about Maximum mode operations of 8086 with neat sketch.	[7M]
		(OR)	
2.	a)	Explain the interrupt structure of 8086 with proper diagrams.	[7M]
	b)	Draw the Register organization of 8086 Microprocessor and explain the operation of each register in detail.	[7M]

UNIT-II

3.	a)	Give the assembly language implementation of the following: i) FOR LOOP ii) REPEAT iii) IF-THEN-ELSE iv) WHILE	[7M]
	b)	Write an Assembly language program to convert a four digit decimal number to its binary equivalent.	[7M]
		(OR)	
4.	a)	Write a program that counts the number of 1s in a binary number.	[7M]
	b)	Explain machine language instruction formats of 8086.	[7M]

UNIT-III

5.	a)	What is A/D converter? Explain the ASIC used for this purpose and write a program to interface it to 8086.	[7M]
	b)	Explain the Initialization Command Words of 8259A.	[7M]
		(OR)	
6.	a)	Explain the need of DMA. Discuss in detail about DMA data transfer method.	[7M]
	b)	Discuss the organization and architecture of 8251(USART) with functional block diagram.	[7M]

UNIT-IV

7.	a)	Explain the different Programming Timer Interrupts of 8051 micro controller.	[7M]
	b)	Explain the memory organization of 8051 microcontroller with suitable diagrams.	[7M]
		(OR)	
8.	a)	Discuss about the register set of 8051 with suitable examples.	[7M]
	b)	Draw and explain the interrupt structure of 8051 micro controller.	[7M]

UNIT-V

9.	a)	Write a brief notes on electromechanical relays with an example.	[7M]
	b)	Explain how a Push button can be connected to 8051.	[7M]
		(OR)	
10.	a)	With a neat sketch explain about Interfacing Seven Segment Display.	[7M]
	b)	Explain about Home automation applications of Micro controllers.	[7M]

Code No: R203204J **R20** SET -3

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Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
*****

UNIT-I

1. a) Explain briefly about data transfer concepts of 8085. [7M]
   b) Give the difference between minimum mode and maximum mode of operation in 8086 microprocessor. [7M]

(OR)

2. a) Sketch the functional pin diagram of 8086 microprocessor and explain the functions of common mode pins. [7M]
   b) Discuss briefly about pre-fetch queue in 8086. [7M]

UNIT-II

3. a) Define assembler directive and explain different assembler directives used in 8086Microprocessor in detail. [7M]
   b) Write an assembly language program to arrange the given array in ascending order, the length of array is ten 16-bit numbers. [7M]

(OR)

4. a) Explain about the following assembler directives of 8086 microprocessor [7M]
   i) EQU ii) EXTRN iii) SEGMENT iv) PUBLIC v) TYPE
   b) Develop an ALP to convert an 8 bit binary number into its equivalent gray code. [7M]

UNIT-III

5. a) Sketch and explain the architecture of 8237A. [7M]
   b) Design a stepper motor controller and write an ALP to rotate shaft of a 4-phase stepper Motor with 200 rotor teeth, for rotations through an angle of 135^0 in 2 seconds. [7M]

(OR)

6. a) Describe the control word formats of 8259. [7M]
   b) Explain the need of DMA. Discuss in detail about DMA data transfer method. [7M]

UNIT-IV

7. a) What is a microcontroller? With a neat block diagram, explain the architecture of 8051 microcontroller. [7M]
   b) Explain the timer modes in 8051 controller. [7M]

(OR)

8. a) Discuss in detail about serial port operation in 8051 microcontroller. [7M]
   b) Explain different program branching instructions supported by 8051. [7M]

UNIT-V

9. a) Develop an 8051 subroutine to control the 7-segment display operation. [7M]
   b) Explain the interfacing of Keyboard with 8051 microcontroller. [7M]

(OR)

10. a) Develop a program for 8051 to transfer the message “GOOD LUCK” serially at baud rate of 9600, 8bit data with 1 stop bit. Do this continuously. [7M]
    b) Explain the Stepper motor control using 8051 microcontroller. [7M]

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*****

UNIT-I

1. a) Sketch and explain the architecture of 8085 microprocessor. [7M]
   b) What is system bus architecture? Give generalized 8086 system bus architecture. [7M]

(OR)

2. a) Sketch the block diagram of maximum mode operation of 8086 processor and explain. [7M]
   b) Discuss about various interrupts in 8086. [7M]

UNIT-II

3. a) Define addressing mode and explain the different addressing modes presented in 8086. [7M]
   b) Develop an assembly language program to find the sum of the squares of first ten numbers. [7M]

(OR)

4. a) Develop an ALP in 8086 to exchange a block of N bytes of data between source and destination. [7M]
   b) Develop a recursive procedure to calculate the factorial of number N, where N is a two digit Hexa number. [7M]

UNIT-III

5. a) Sketch the Internal architecture of 8259 Programmable interrupt controller and explain the operation of each block in detail. [7M]
   b) Illustrate the Intel 8251 USART architecture. [7M]

(OR)

6. a) List the salient features of strobed I/O mode of operation of 8255. Also present the input and output control signal definitions. [7M]
   b) Sketch the functional diagram of ADC0808, and explain its operation along with interfacing diagram. [7M]

UNIT-IV

7. a) Sketch the pin diagram of 8051 microcontroller and explain the function of each pin in detail. [7M]
   b) Explain the interrupt structure of the 8051 microcontroller. [7M]

(OR)

8. a) Explain the structure of Program Status Word register of 8051. [7M]
   b) Illustrate the structures of TMOD and TCON registers and explain. [7M]

UNIT-V

9. a) How bit level XOR operations can be done in 8051. [7M]
   b) Explain the interfacing of display with 8051 microcontroller. [7M]

(OR)

10. a) Explain the Servomotor control using 8051 microcontroller. [7M]
    b) Discuss application to automation systems. [7M]