Hall Ticket No | | | | | | | | | | |

Question Paper Code: AEC023

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-I

B.Tech VI Semester End Examinations, April - 2020

Regulations: IARE-R16

MICROPROCESSOR INTERFACING AND APPLICATIONS

(Information Technology)

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

		UNIT – I	**Marks**
1	a)	Calculate the effective address & physical address of the following instructions. (a) IMUL AX, [BP + BX –8D] (b) SBB AL, ES:[SI + 5D] (c) PUSH AX (d) AND AH, [SI + 42D] (e) CMPSB (f) CMPB DX, [SI]. Assume CS = 5000H, DS = 8000H, SS = A000H, ES = B000H, SI = 2000H, DI = 6000H, BP = 1002H, SP = 0002H, AX = 0000H, BX = 5200H, CX = 2000H.	[7M]
	b)	Write in detail about the register organization of 8086 microprocessor and explain about each register.	[7M]
2	a)	Discuss about the following addressing modes of 8086 processor. i) Based Index ii) Register relative	[7M]
	b)	Explain about procedures and Macros. Identify the memory address of the next instruction executed by the microprocessor, when operated in the real mode, for the following CS:IP combinations: i) CS = 1000H and IP = 2000H ii) CS= 2000h and IP=10000h	[7M]
		UNIT – II	
3	a)	Write an assembly language program to arrange the numbers in ascending and descending order.	[7M]
	b)	Describe about following string Manipulation instructions. i) MOVSB ii) CMPSB iii) SCASB	[7M]
4	a)	Write an assembly language program to insert and delete a byte into the give array using 8086 microprocessor .	[7M]

	b)	Discuss about minimum mode and maximum mode operations of 8086 with neat sketch and timing diagrams for both minimum and maximum modes?	[7M]

UNIT – III

5	a)	Define the importance of PPI? Explain in detail about the operating modes of 8255 with neat diagrams?	[7M]
	b)	Write an assembly language program to interface stepper motor with 8086 and rotate in clock wise direction with speed of 30RPM. (Assume oscillator frequency of 8 MHz).	[7M]
6	a)	Define DMA? Explain about DMA transfer method? Discuss the advantages and disadvantages in DMA transfer Method?	[7M]
	b)	What is an interrupt? Explain about interrupt structure of 8086 and also gives the priority order of 8086 interrupts?	[7M]

UNIT – IV

7	a)	Explain about Asynchronous modes and Synchronous modes of communications with the help of diagrams in 8086?	[7M]
	b)	Define USART? Explain about the functional block diagram of Universal Synchronous and Asynchronous Receiver Transmitter?	[7M]
8	a)	Discuss the pin structure of RS232C. Explain voltage and current specifications of RS 232C?	[7M]
	b)	Explain about the simplex, Half duplex and Full Duplex modes of communication present in 8086 microprocessor?	[7M]

UNIT – V

9	a)	Give the important features of 80286 and explain about the functional block diagram of 80286 in detail with neat diagram?	[7M]
	b)	Discuss about memory access in GDT and LDT and explain about the structure of GDT and LDT with neat diagrams?	[7M]
10	a)	Explain about the architecture of 80386 and explain how many types of 80386 microprocessors are available in present market?	[7M]
	b)	Describe the difference between paging and segmentation and explain about paging mechanism present in 80386?	[7M]

INSTITUTE OF AERONAUTICAL ENGINEERING

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COURSE OBJECTIVES:

I	Understand the concept of microprocessor and familiarize the architecture of 8085and 8086processor.
II	Analyze the assembly language programming using 8086 microprocessor.
III	Develop the knowledge of microprocessor based systems and interfacing techniques.
IV	Understand the concept of Interrupts and their significance in 8086.
V	Impart the basic concepts of serial and parallel bus standards.
VI	Understand the basic concept of advanced processor architectures.

COURSE OUTCOMES:

CO 1	Describe the concepts of Architectures of 8085 and 8086 with its functionalities and understand the addressing modes and instructions sets of 8086
CO 2	Describe Minimum mode and maximum mode of operation of 8086 and Analyze the Assembly language programs involving in various arithmetic and logical operations.
CO 3	Discuss the importance of 8255 ,8257 and explain interfacing of I/O device with different modules.
CO 4	Analyze the various synchronous and asynchronous serial data transfer schemes in 8086 and importance of 8251
CO 5	Understand the advanced 16 and 32 bit microprocessors architectures and its features..

COURSE LEARNING OUTCOMES:

AEC023.01	Differentiate between 8085 and 8086 microprocessors architectures and its functionalities.
AEC023.02	Describe the internal Architecture of 8086 microprocessor and explain its functionalities.
AEC023.03	Describe in detail about functions of general purpose register and 8086 flag register with its functions.
AEC023.04	Explain various addressing modes and instruction set present in 8086 microprocessors and Describe in detail about the concept of interrupt, types of interrupts 8086 microprocessor.
AEC023.05	Understand and apply the fundamentals and procedures and assembler directives of assembly level programming of microprocessors.
AEC023.06	Develop low level languages like ALP in 8086 Microprocessor systems for real time applications
AEC023.07	Describe Minimum mode and maximum mode of operation and timing diagram of 8086 Microprocessor
AEC023.08	Explain various Assembly language programs involving logical, branch and call instructions.
AEC023.09	Evaluation of arithmetic expressions, string manipulation, sorting using various Assembly language programs.
AEC023.10	Identify the importance of Various modes of 8255 operation and interfacing to 8086.
AEC023.11	Discuss the interfacing diagram of I/O devices with keyboard, stepper motor, 7-segment display, LCD and digital to analog and analog to digital converter.
AEC023.12	Explain in detail about the importance of DMA,interrupt and interrupt sub routines in 8086 microprocessor
AEC023.13	Analyze and understand various synchronous and asynchronous serial data transfer schemes in 8086.

AEC023.14	Develop and design the interfacing circuit diagram of 8251USART with 8086 processor.
AEC023.15	Understand the high- speed serial communications standards, USB.
AEC023.16	Understand basic architecture of 16 bit and 32 bit Microprocessors with the help of GDT, LDT and multitasking and addressing modes.
AEC023.17	Flag register 80386: Architecture, register organization, memory access in protected mode
AEC023.18	Analyze the various advanced microprocessors internal architectures for 80X86 by paging and technical features.

MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

SEE Question No.		CLO Code	Course learning Outcomes	CO code	Blooms Taxonomy Level
1	a	AEC023.04	Explain various addressing modes and instruction set present in 8086 microprocessors and Describe in detail about the concept of interrupt, types of interrupts 8086 microprocessor.	CO 1	Understand
	b	AEC023.03	Describe in detail about functions of general purpose register and 8086 flag register with its functions.	CO 1	Understand
2	a	AEC023.04	Explain various addressing modes and instruction set present in 8086 microprocessors and Describe in detail about the concept of interrupt, types of interrupts 8086 microprocessor.	CO 1	Understand
	b	AEC023.05	Understand and apply the fundamentals and procedures and assembler directives of assembly level programming of microprocessors.	CO 1	Understand
3	a	AEC023.08	Explain various Assembly language programs involving logical, branch and call instructions.	CO 2	Remember
	b	AEC023.04	Explain various addressing modes and instruction set present in 8086 microprocessors and Describe in detail about the concept of interrupt, types of interrupts 8086 microprocessor.	CO 2	Understand
4	a	AEC023.09	Evaluation of arithmetic expressions, string manipulation, sorting using various Assembly language programs	CO 2	Understand
	b	AEC023.07	Describe Minimum mode and maximum mode of operation and timing diagram of 8086 Microprocessor	CO 2	Understand
5	a	AEC023.10	Identify the importance of Various modes of 8255 operation and interfacing to 8086.	CO 3	Remember
	b	AEC023.11	Discuss the interfacing diagram of I/O devices with keyboard, stepper motor, 7-segment display, LCD and digital to analog and analog to digital converter.	CO 3	Understand
6	a	AEC023.12	Explain in detail about the importance of DMA,interrupt and interrupt sub routines in 8086 microprocessor	CO 3	Remember
	b	AEC023.12	Explain in detail about the importance of DMA,interrupt and interrupt sub routines in 8086 microprocessor	CO 3	Understand
7	a	AEC023.13	Analyze and understand various synchronous and asynchronous serial data transfer schemes in 8086	CO 4	Understand
	b	AEC023.14	Develop and design the interfacing circuit diagram of 8251USART with 8086 processor.	CO 4	Remember

8	a	AEC023.15	Understand the high- speed serial communications standards, USB.	CO 4	Understand
	b	AEC023.15	Understand the high- speed serial communications standards, USB.	CO 4	Understand
9	a	AEC023.16	Understand basic architecture of 16 bit and 32 bit Microprocessors with the help of GDT, LDT and multitasking and addressing modes.	CO 5	Remember
	b	AEC023.16	Understand basic architecture of 16 bit and 32 bit Microprocessors with the help of GDT, LDT and multitasking and addressing modes.	CO 5	Understand
10	a	AEC023.17	Flag register 80386: Architecture, register organization, memory access in protected mode	CO 5	Remember
	b	AEC023.18	Analyze the various advanced microprocessors internal architectures for 80X86 by paging and technical features	CO 5	Understand

Signature of Course Coordinator **HOD, IT**