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

Question Paper Code: AEC013

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER –II

B.Tech VI Semester End Examinations, May -2020

Regulation: R16

MICROPROCESSOR AND MICROCONTROLLERS

(Only for ECE)

Time: 3 Hours **Max Marks: 70**

Answer any ONE question from each Unit
All questions carry equal marks
All parts of the question must be answered in one place only

UNIT – I

1 a) Explain indetail about minimum mode operations of 8086 with neat timing diagrams. [7M]

b) Describe the function of the following signals [7M]
   i. NMI
   ii. LOCK
   iii. TEST
   iv. RESET

2 a) Describe the functionality of 8086 microprocessor pins with the help of block diagram. [7M]

b) Classify the various addressing modes of 8086 with examples and explain addressing modes indetail with examples. [7M]

UNIT – II

3 a) Draw and discuss the interrupt structure of 8086. Also elaborate the difference between software and hardware interrupts [7M]

b) Write the Assembly level program for given numbers arrange in Ascending Order using bubble sort algorithm. [7M]

4 a) Compare Machine level language and assembly level language. Also discuss about the interrupt cycle of 8086 microprocessors.. [7M]

b) Write an assembly language program to, [7M]
   i) Insert a byte into the give array
   ii) Convert ASCII to BCD.

UNIT – III

5 a) Write how many I/O modes of operations present in 8255 Programmable Peripheral Interface and explain any two modes [7M]

b) Define interrupt vector and ISR and draw the Interrupt Vector table for 8086 Microprocessor. [7M]

6 a) How to interface a DMA controller with a microprocessor? Explain how DMA controller transfers large amount of data from one memory locations to another memory locations [7M]

b) Explain the transmission and reception of serial data using 8251 indicating the functions o various registers in it. [7M]

UNIT – IV

7 a) Draw the functional block diagram of 8051 and explain memory configuration in detail. [7M]

b) Generate 8051 program to move a block of data from external program memory to external data memory. [7M]

8 a) Discuss in detail about internal and external memory organization of 8051 Microcontroller [7M]

b) Develop a program in 8051 to count number of zero bits available in a byte available in external RAM at 1000h. Store zero bit count in internal RAM location 60H. [7M]

UNIT – V

9 a) Describe the interrupt structure of 8051 microcontroller with suitable diagrams [7M]

b) Interface digital to analog converter DAC 08 and write ALP to generate square wave using 8051 microcontroller. [7M]

10 a) Differentiate between timer and counter? Explain the 16-bit timer mode and 8-bit auto-reload mode of 8051 microcontroller. [7M]

b) Write a assembly level program to generate 2 kHz square wave form at port 1.0 of 8051 Microcontroller. [7M]

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I. COURSE OBJECTIVES

The course should enable the students to

I	Introduce the basic concepts of microprocessors and to develop in students the assembly language programming skills and real time applications of Microprocessors.
II	Understand the concept of microprocessor and familiarize the architecture of 8085and 8086 processor.
III	Develop the knowledge of microprocessor based systems and interfacing techniques.
IV	Understand the basic concept of advanced processor architectures.
V	Impart the basic concepts of serial and parallel bus standards.
VI	Understand the basic concept of advanced processor architectures.

II. COURSE OUTCOMES (COs):

CO 1	Acquire knowledge about architecture and functional features of microprocessors particularly 8086
CO 2	Obtain an insight in to the instruction set of 8086 and write programs in assembly level language
CO 3	Interface different types of external peripherals like 8255,8259,8279, 8251 &8257 with 8086
CO 4	Imbibe knowledge about hardware details of 8051 microcontrollers and develop assembly language programs for data transfer, arithmetic, logical and branch instructions.
CO 5	Design simple systems using timers, interrupts, memories ADC and DACs etc. using 8051.

III. COURSE OUTCOMES

AEC013.01	Understand the internal Architecture and different modes of operation of popular 8086 microprocessors.
AEC013.02	Basic understanding of 8085 and 8086 microprocessors architectures and its functionalities.
AEC013.03	An ability to distinguish between RISC and CISC based microprocessors.
AEC013.04	Understand the importance of addressing modes and the instruction set of the processor which is used for programming.
AEC013.05	Understand and apply the fundamentals of assembly level programming of microprocessors.
AEC013.06	Design and develop 8086 Microprocessor based systems for real time applications using low level language like ALP.
AEC013.07	Ability to interface the external peripherals and I/O devices and program the 8086 microprocessor using 8255.
AEC013.08	Understand the memory organization and interrupts of processors helps in various system designing aspects.
AEC013.09	Identify the significance of serial communication in8086 with required baud rate
AEC013.10	An ability to distinguish between the serial and parallel data transfer schemes.
AEC013.11	Identify the significance of interrupts and interrupt service routines with appropriate illustrations.
AEC013.12	Develop the interfacing of universal synchronous asynchronous receiver transmitter 8251 with 8086 processor
AEC013.13	Ability to interface the programmable interrupt controller 8259 with 8086.
AEC013.14	Understand the internal Architecture and different modes of operation of popular 8051 microcontrollers.
AEC013.15	Basic understanding of 8051 microcontrollers functionalities.
AEC013.16	Understand the different addressing modes used in assembly language programming of microcontrollers.
AEC013.17	Write programs for arithmetic and logical computations using 8051 instruction sets.

AEC013.18	Construct, and develop of required delay circuits using timers of 8051 in the laboratory.
AEC013.19	Interfacing of physical elements using Digital and analog converters with microcontrollers.
AEC013.20	Assess and interface required memory to microcontrollers with appropriate memory mapping.
AEC013.21	Apply concept of microprocessors and microcontrollers to understand and analyze real time applications.
AEC013.22	Acquire the knowledge and develop capability to succeed national and international level competitive examinations.

IV. MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES

Students, who complete the course, will have demonstrated the ability to do the following:

SEE Question No.		Course Outcomes		CO	Blooms Taxonomy Level
1	a	AEC013.02	Basic understanding of 8085 and 8086 microprocessors architectures and its functionalities.	CO 1	Understand
	b	AEC013.02	Basic understanding of 8085 and 8086 microprocessors architectures and its functionalities.	CO 1	Understand
2	a	AEC013.05	Understand and apply the fundamentals of assembly level programming of microprocessors.	CO 1	Understand
	b	AEC013.05	Understand and apply the fundamentals of assembly level programming of microprocessors.	CO 1	Understand
3	a	AEC013.05	Understand and apply the fundamentals of assembly level programming of microprocessors.	CO 2	Remember
	b	AEC013.05	Understand and apply the fundamentals of assembly level programming of microprocessors.	CO 2	Understand
4	a	AEC013.08	Understand the memory organization and interrupts of processors helps in various system designing aspects.	CO 2	Remember
	b	AEC013.07	Ability to interface the external peripherals and I/O devices and program the 8086 microprocessor.	CO 2	Remember
5	a	AEC013.08	Understand the memory organization and interrupts of processors helps in various system designing aspects.	CO 3	Remember
	b	AEC013.08	Understand the memory organization and interrupts of processors helps in various system designing aspects.	CO 3	Understand
6	a	AEC013.07	Ability to interface the external peripherals and I/O devices and program the 8086 microprocessor.	CO 3	Remember
	b	AEC013.14	Ability to interface the Programmable interupt controller(PIC) 8259 with 8086.	CO 3	Remember
7	a	AEC013.14	Understand the internal Architecture and different modes of operation of popular 8051 microcontrollers.	CO 4	Understand
	b	AEC013.17	Write programs for arithmetic and logical computations using 8051 instruction sets.	CO 4	Remember
8	a	AEC013.14	Understand the internal Architecture and different modes of operation of popular 8051 microcontrollers.	CO 4	Remember
	b	AEC013.20	Assess and interface required memory to microcontrollers with appropriate memory mapping.	CO 4	Understand
9	a	AEC013.14	Understand the internal Architecture and different modes of operation of popular 8051 microcontrollers.	CO 5	Understand
	b	AEC013.21	Apply concept of microprocessors and microcontrollers to understand and analyze real time applications.	CO 5	Understand
10	a	AEC013.18	Construct, and develop of required delay circuits using timers of 8051 in the laboratory.	CO 5	Understand
	b	AEC013.14	Understand the internal Architecture and different modes of operation of popular 8051 microcontrollers.	CO 5	Understand

Course Coordinator **HOD,ECE**