Lecture Plan -1

Semester: - Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic:-Introduction To The Syllabus And Introduction Of Microprocessor.	Time Allotted:-
1.	**Introduction** The syllabus comprises six chapters and two units, three chapters under each unit. The microprocessor 8085 and 8086 are the most important chapters in the syllabus. along with this there are programmable peripheral interface IC 8255,DMA controller IC8237, Programmable interrupt controller IC 8259 and programmable interval timer IC 8253. The **MICROPROCESSOR** is the most important component of the digital computer. It acts as the brain of the computer.	10 min
2	**Division of the Topic** -introduction to microprocessor. -Evolution of microprocessor -World length of a computer or the microprocessor. -Important INTEL microprocessors	30 min
3.	**Conclusion** The central processing unit, which is built on a single IC, is called the microprocessor. A digital computer in which one microprocessor has been provided to act as a CPU Is called a microcomputer. The CPU of a large powerful digital computer contains more than one microprocessor. High-end powerful servers, mainframe computers, supercomputers etc. contains more than one microprocessor to act as the CPU. These microprocessors are placed in the CPU of the powerful computer in parallel. These computers are called a multiprocessor system.	5 min
4	**Question /Answer** Q .what is the word length of 4004 microprocessor? Ans. it is 4-bit Q. what is the difference between the 8085 and 8086 on the basis of world length? Ans. 8085 is 8-bit microprocessor while the 8086 is the 16-bit microprocessor.	5 min

Assignment to be given:-nil

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

Lecture Plan -2

Semester: - Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic :-Introduction To 8085, Architecture Of 8085 Microprocessor	Time Allotted:-
1.	**Introduction** **Intel** 8085 is an 8-bit, n-mos microprocessor. It is a 40 pin I.C. package fabricated on a single LSI chip. Intel 8085 uses a +5 v dc supply for its operation. Its clock speed is about 3MHz.the clock cycle is of 320 ns. It has 80 basic instructions and 246 opcodes. t has three main units 1 arithmetic and logic unit 2 Timing and control unit 3 Set of registers	5 min
2	**Division of the Topic** Introduction to 8085 Architecture of 8085 Arithmetic and logic unit Timing and control unit. Different types of registers in 8085 Data bus and address bus of 8085	30 min
3.	**Conclusion** **ALU** performs the arithmetic and logical operations. The **TIMING AND CONTROL UNIT** generates the timing and control signals which are necessary for the execution of the instructions. Along with this, in the 8085, there are a set of **REGISTERS**. These registers are used by the microprocessor for temporary storage and manipulation of data. Data remain in the registers till they are sent to the memory or I/O devices.	5 min
4	**Question /Answer** **Q .what are the status flags in the microprocessor 8085?** Ans.8085 has 5 flip flops to serve as the status flags. These are set or reset according to the conditions which arise during an arithmetic or logical operation. These are Carry(CS),parity(P),auxiliary carry flag (AC),zero flag (Z) and sign flag (S) **Q.what is program counter (PC**)? Ans it is a 16-bit special purpose register .it is used to hold the memory address of the next instruction to be executed	5 min

Assignment to be given:-Explain the architecture of 8085.

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan -3

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic :-Pin Configuration Of 8085	Time Allotted:-
1.	**Introduction** Intel 8085 is a 40 pin IC. It is an 8-bit microprocessor. Its data bus is 8-bit wide and hence 8-bit data can be transmitted from or to the microprocessor. It requires a 16-bit address bus as the memory addresses are 16-bits. The 8 most significant bits of the address are transmitted by the address bus. The 8- least significant bits of the address are transmitted by address/data bus.	5 min
2	**Division of the Topic** Pin configuration of 8085 Description of various pins Opcode and operand Classification of the instructions on the basis of word size One byte ,two byte ,three byte instructions **Instruction cycle**: fetch operation Execution cycle	30 min
3.	**Conclusion** Each instruction contains two parts: operation code (opcode) and operand. The first part of an instruction which specifies the task to be performed by the computer is called opcode. The second part of the instruction is the data to be operated on and it is called operand. In some instructions the operand is implicit. When the operand is a register it is understood that the data is he content of the register.	5 min
4	**Question /Answer** **Q .**what is the significance of AD_0—AD_7 pins in the 8085 microprocessor? Ans. these are time multiplexed address/data bus. They serve the dual purpose. Q.what is the significance of HLDA pin in 8085? Ans. it is an output pin. It is a signal for hold acknowledgement. It indicates that the hold request has been received.	5 min

Assignment to be given:-What is difference between opcode and operand?

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.Ram**

Lecture Plan -4

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic :-Addressing Modes Of 8085	Time Allotted:-
1.	**Introduction** Each instruction requires some data on which it has to operate. These are various techniques to specify the data for instruction. These techniques are called the addressing modes. Intel 8085 uses the following addressing modes: 1 Direct addressing 2 register addressing 3.register indirect addressing 4 immediate addressing	5 min
2	**Division of the Topic** -Direct addressing with example -Examples of register addressing -Examples of register indirect addressing -Immediate addressing -Implicit addressing	30 min
3.	**Conclusion** **Intel 8085** is an 8-bit microprocessor. It handles 8-bit data at a time. One byte consists of 8-bits. A memory location for 8085 is designed to accommodate 8-bit data. If 16-bit data are to be stored, they are to be stored in consecutive memory location. The address of memory location is of 16 bits i. e. 2 bytes. There are various techniques to specify the data for the instructions. Therefore the instructions may be single byte, two byte or the three byte instructions.	5 min
4	**Question /Answer** Q. in the implicit addressing mode where is the data? Ans. in the accumulator. These instructions operate on the content of the accumulator. Q. what is the meaning of MOV A, B? Ans move the content of register B to register A.	5 min

Assignment to be given:-nil
Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER**

Lecture Plan -5

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic :-Instruction Set Of 8085 And Data Transfer Instructions And Examples	Time Allotted:-
1.	**Introduction** **Intel 8085** is an 8-bit microprocessor. It handles 8-bit data at a time . One byte consist of 8-bits. A memory location for 8085 is designed to accommodate 8-bit data. If 16-bit data is stored in consecutive memory location. The address of memory location is of 16 bits i. e. 2 bytes. Thee are various techniques to specify the data for the instructions. Therefore the instructions may be single byte, two byte or the three byte instructions. .	5 min
2	**Division of the Topic** -Symbols and abbreviations used in intel 8085 instructions -Data transfer instructions -No. of states in different instruction -Addressing mode of the instruction -No. of machine cycles	30 min
3.	**Conclusion** In instruction is a command given to the computer to perform a specified operation on given data. To perform a particular task a programmer writes a sequence of instructions called a program. Program and data are stored in the memory. The cpu etches one instruction from the memory at a time and execute it. It execute all the instructions one by one to produce to the final result.	5 min
4	**Question /Answer** **Q .**how many machine cycles will be required for the MOV r,M instruction? Ans.two machine cycles Q. which status flag changes with data transfer instructions? Ans no status flag is affected by the data transfer instructions.	5 min

Assignment to be given:-What do you mean by T-State?

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM**

Lecture Plan -6

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic :-Arithmetic Instructions And Examples	Time Allotted:-
1.	**Introduction** The instruction in this group perform the arithmetic operations such as addition ,subtraction, increment, decrement of the content of the register or the memory.8-bits or the 16-bits data may be given directly in the instruction itself or the address of the memory location , I/O port or the I/O device ,where data resides may be given in the instruction. In some instruction data is implied while in some instructions two registers are given and the contents of the two register are the data .	5 min

2	**Division of the Topic**
	Arithmetic group of instructions: add instructions
	                      Subtract instructions
	                     Increment instructions
	                     Decrement instructions
	Flags effected by the arithmetic instructions
	Addressing modes in different instruction
	No. of machine cycles in different arithmetic instructions
		30 min

3.	**Conclusion** The necessary step to that a CPU carries out to fetch an instruction and necessary data from the memory and to execute it ,constitute the instruction cycle. The instruction cycle consist of fetch cycle and the execute cycle. In fetch cycle a CPU fetches opcode from the memory. The first byte of an instruction is the opcode. The necessary step which are carried out to get data if any from the memory and to perform the specific operation specified by the instruction constitute an execute cycle.	5 min
4	**Question /Answer** Q .which status flag is not affect ed by the arithmetic instructions? Ans. all the flags are effected by the arithmetic instruction. Q. what is the meaning of DAA? Ans.decimal adjust accumulator it is operated after ADD,ADC etc. instructions . after the daa instruction the final result comes in the decimal system	5 min

Assignment to be given:-Explain the following instructions:- ADD,SUB,SBB,ADC,DAA.

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER**
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Lecture Plan -7

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-**MICROPROCESSOR AND INTERFACING**   Section-A

S. No.	Topic :-Logical And Branch Group Instructions	Time Allotted:-
1.	**Introduction** The instructions under the logical group performs the logical operations such as AND OR,, COMPARE, ROTATE etc. branch control instructions includes the instructions for conditional and non-conditional jump. The opcode fetched from the memory goes to the data register and then to the instruction register. From the instruction register it goes to the decoder circuitry which decodes the instruction. After the instruction is decoded ,execution begins. .	10 min
2	**Division of the Topic** **-Logical instructions:** AND instructions OR instructions EX-OR instructions COMPLEMENT instructions ROTATE instructions **-Branch instructions:** Conditional branch instructions Un conditional branch instructions	25 min
3.	**Conclusion :** The logical instructions perform logical operations on the data in registers or memory. The branch instructions change the normal sequence of the program .the conditional branch instructions transfer the program to the specified label when certain condition is satisfied .the unconditional branch instructions transfer the program to the specified label unconditionally.	5 min
4	**Question /Answer** Q .flags are effected or not by the logical instructions? Ans . Logical instructions effect the status flags. Q. what is the meaning of ANA r? Ans it AND the content of the register with the accumulator	5 min

Assignment to be given:-Explain the following instructions: RCL,RAR,RCR,ROL

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan -8

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

<u>Subject</u>:-MICROPROCESSOR AND INTERFACING   Section-A

S. No.	Topic :-Stack,I/O And Machine Contol Instructions Interrupt Structure	Time Allotted:-
1.	**Introduction** This group includes the instructions for input/output ports, stack and machine control instruction. PUSH, POP, HLT etc. instructions under this category. The stack is sequence of memory locations set aside by the programmer to store or retrieve the contents of the accumulator, flags, program counter and general purpose register during the execution of the program. .	5 min
2	**Division of the Topic** -Stack -In port instructions -Out-port instructions -Push ,pop instructions -Special instructions -Interrupt structure of 8085	30 min
3.	**Conclusion** Any portion of the memory can be used as the stack. Since the stack works on LIFO principal ,its operation is faster as compare to normal store /retrieve of memory locations. During the execution of a program sometimes it becomes necessary to save the contents of some registers which are needed for some other operations in the subsequent steps of the program .the contents of such registers are saved in the stack. There are special instructions to save or retrieve the data from the stack. .	5 min
4	**Question /Answer** Q . On which principal the stack works? Ans. LIFO---last in first out Q. what is interrupt? Ans. it stops the normal processing of the microprocessor.	5 min

<u>Assignment to be given:-</u>What is difference between stack and subroutine?

<u>Reference Readings:-</u> **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER**
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Lecture Plan -9

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-A

S. No.	Topic :-Examples Of Assembly Language Programming	Time Allotted:-
1.	**Introduction** A computer can do the program what the programmer asks to do. A sequence of instructions is called the program. A computer can understand the information only in the form of zeroes(0) and one(1).a program written in this language is called the machine language program. In the machine language thee is a specific binary code for each instruction. This is called the low level language. A programmer can easily write a program in alphanumeric symbols instead of zeroes and one. Assembly language is one of them and the symbols used in this are called the mnemonics.	5 min
2	**Division of the Topic** -low level language -Assembly language -Assembler -Disassemble -Assembly language programming -Introduction to high level language.	30min
3.	**Conclusion** Assembly language is preferred in real time control applications, the situations where small volume of data are to be processed, where cost of memory is a consideration, in Training kits, in developing a program for microprocessor –based system for industrial control, in training kits.	5 min
4	**Question /Answer** **Q**. what is an assembler? Ans. a program which converts an assembly language program into a machine language program. Q. what do you mean by mnemonics? Ans. the symbols of the assembly language program are known as the mnemonics	5 min

Assignment to be given:-WAP for addition of two 16 bit numbers.

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan -10

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-A

S. No.	Topic :-Examples Of Assembly Language Programming	Time Allotted:-
1.	**Introduction** To arrange a data array in ascending order .arrange E5,A9,96,B4 and 15 in ascending order .these are in the memory locations 2501- 2500	5 min
2	**Division of the Topic** -low level language -Assembly language -Assembler -Disassemble -Assembly language programming -Introduction to high level language.	30min
3.	**Conclusion** Assembly language is preferred in real time control applications, the situations where small volume of data are to be processed, where cost of memory is a consideration, in Training kits, in developing a program for microprocessor –based system for industrial control, in training kits.	5 min
4	**Question /Answer** **Q**. what is an assembler? Ans. a program which converts an assembly language program into a machine language program. Q. what do you mean by mnemonics? Ans. the symbols of the assembly language program are known as the mnemonics	5 min

Assignment to be given:-WAP for addition of two 16 bit numbers.

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan -11

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic :-Introduction To 8255 PPI	Time Allotted:-
1.	**Introduction** A programmable peripheral interface (PPI) is a multiport device. The ports may be programmed in a variety of ways as required by the programmer. This device is very useful for interfacing peripheral devices. It is also known as PIA Peripheral Interface Adapter. .	10 min
2	**Division of the Topic** Introduction to 8255 Types of 8255 1.) 8255A 2.) 8255A-5	30 min
3.	**Conclusion** The main function of the 8255 is to interface peripheral devices to the microcomputer. It has three 8-bit ports, namely port A, port B and port C. The port C is further divided into two of 4-bit ports, port c upper and port c lower. Thus a total four ports are available. Two 8-bit ports and two 4-bit ports. Each port can be programmed as the input or the output port.	5 min
4	**Question /Answer** Q how many lines are present in the data bus of the 8255? Ans. 8 parallel lines Q. what is the electrical voltage requirement for the operation of the 8255? Ans.5 V dc supply	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan -12

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-   MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic :-Pin Diagram Of 8255	Time Allotted:-
1.	**Introduction** The main function of the 8225 is to interface peripheral devices to the microcomputer. It has three 8-bit ports, namely port A, port B and port C. The port C is further divided into two of 4-bit ports, port c upper and port c lower.	10 MIN
2	**Division of the Topic** Schematic diagram of 8255. Pin diagram of 8255 Pins of various ports Control word register	30 MIN
3.	**Conclusion** 8255 is a 40-pin IC package. It operates on a single power supply of 5 V dc. Its ambient temp. Range is 0-70^{0} .voltage on any pin is 0.5 V to 7V.power dissipation is 1 watt.	5 MIN
4	**Question /Answer** Q. what is the function of CHIP SELECT pin? Ans. it is a chip select signal .the low status of this signal enables communication between the CPU and the 8255. Q. which pins are used for the ports selection? Ans. pin A_0 and A_1 .	5 MIN

Assignment to be given:-
Explain the pin diagram of 8255 PPI chip.

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan-13

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic :-BSR and I/O control word of 8255	Time Allotted:-
1.	**Introduction** According to the requirement , a port can be programmed to act either as an input port or output port. For programming the ports of 8255 a control word is formed. Control word is written in the control word register which is within the 8255. The control word bit corresponding to a particular port is set to either 1 or 0 depending upon the definition of the port, whether it is to be made an input ort or the output port.	10 MIN
2	**Division of the Topic** - Control word register of 8255 -Control word register bits of 8255	30 MIN
3.	**Conclusion** If a particular port is to be made as output port, the bit corresponding to that port is set to 1. For making a port as output port , the corresponding bit for the port is set to zero.	5 MIN
4	Question /Answer Q. the 8255 can be programmed to work in how many modes? Ans. three. Mode-0, mode-1, mode-2 Q. all the ports can be programmed to work as input or output port in any mode . True or false? Ans. false only port A can be programmed to work in mode-2.	5 MIN

Assignment to be given:-Give the status word and control word of 8255 PPI.

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER
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Lecture Plan-14

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic :-Different Modes Of 8255	Time Allotted:-
1.	Introduction The 8255 has following three modes of operation:- Mode 0 Mode 1 Mode 2	10 min
2	Division of the Topic -Simple input/output mode -Strobe input/output -bidirectional port	30 min
3.	Conclusion In Mode 0,a port can be operated as simple input output port. While Port A and Port B both are designed for strobe input/output.	5 min
4	Question /Answer Q.Port B can not be operated in which mode? A. mode 2 Q.What is control word for port A? A.00	5 min

Assignment to be given:-Explain various modes of operations of 8255

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan -15

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic :-Programming Of 8255	Time Allotted:-
1.	**Introduction** According to requirement, a port can be programmed to act either as input port or output port.	10 min
2	**Division of the Topic** -Control word bits for 8255 -Examples of Control word -Examples of programming	30 min
3.	**Conclusion** For programming the ports of 8255 a control word is formed. The control word bit is made 1 or 0 depending on the definition of port.	5 min
4	**Question /Answer** **Q** . What have to set to make port as input port? Ans. The bit is set to 1. Q. What to set to make port as output port? Ans. The bit is set to 0.	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER**
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Lecture Plan -16

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND INTERFACING   Section-D

S. No.	Topic :-Introduction To DMA Process	Time Allotted:-
1.	**Introduction** In DMA data transfer, data are directly transferred from an input / output device to RAM. Or vice versa. .	10 min
2	**Division of the Topic** -Introduction to DMA -Pin Diagram of 8257 - Explanation of pins	30 min
3.	**Conclusion** For DMA data transfer, the data and address buses come under the control of the peripheral device.	5 min
4	Question /Answer Q .How many pins are there in DMA? Ans. 40 pins Q. What is DACK signal? Ans DMA Acknowledgement	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-17

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic :-Introduction To Dma Controller IC 8237	Time Allotted:-
1.	**Introduction** 8237 A is high performance DMA controller .It contains four independent DMA channels. All channels have autoinitialisation capability.	10 min
2	**Division of the Topic** -Pin diagram of 8237 A -Registers of 8237A -Current address register -Current word count register -Base address and base word count register	30min
3.	**Conclusion** After the end of a data transfer process each channel can auto initialize to its original condition. It is accomplished by software.	5 min
4	**Question /Answer** Q.What is EOP. A. End of process Q.What is DREQ? A.DMA request lines	5 min

Assignment to be given:-How many channels are there in DMA?

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM AND MICROCOMPUTERS BY—B.RAM**

Lecture Plan-18

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-D

S. No.	Topic:- Different Modes Of Operation Of 8237	Time Allotted:-
1.	**Introduction** The 8237 can be operated in four DMA modes viz .single transfer mode ,block transfer mode, demand transfer mode and cascade mode .it has two basic type of transfer and memory to memory transfer.	10 min
2	**Division of the Topic** -single transfer mode - block transfer mode - demand transfer -cascade mode -peripheral transfer - memory to memory transfer	30 min
3.	**Conclusion** There are three types of peripheral transfer viz DMA read ,DMA write and DMA verify .these transfer are similar to 8257 transfer except that DACK pulse of either active high or active low and external EOP is at the rising edge	5 min

4	**Question /Answer**
	  Q. What is block transfer mode?
	   A. all bytes are transferred continuously after each transfer ,it decrements counts register and increment or decrement address register
		5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8086.   BY – Douglas hall**
FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM

Lecture Plan-19

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND INTERFACING   Section-**B**

S. No.	Topic:- Architecture, Block Diagram Of 8086	Time Allotted:-
1.	**Introduction** The 8086 contains two independent functional units:-bus interface unit (BIU) and an execution unit (EU).The BIU handles transfer of data and addresses between the processor and memory/IO devices.	<u>10 min</u>
2	**Division of the Topic** -General purpose registers -pointers -index registers -Segment registers -instruction pointer -queue	<u>30 min</u>
3.	**Conclusion** **Intel 8086** is a 16-bit microprocessor. It handles 16-bit data at a time. Its speed is greater than that of 8085 due to pipelining.	<u>5 min</u>

4	**Question /Answer**
	    R. Name the general purpose registers of 8086.
	    A. AX,BX,CX,DX
	    Q. What is code segment register/
	    A. It points to the starting address of the code segment**.**
		<u>5 min</u>

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-20

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND INTERFACING   Section-**B**

S. No.	Topic :-Pin Diagram Of 8086 And Description Of Various Signals	Time Allotted:-
1.	**Introduction** The 8086 is a 40 pin Licit uses 20 address lines.It can access upto 1 Mbyte of memory. The 16 bit data word is divided into low order byte and high order byte.	10 min
2	**Division of the Topic** -AD0-AD15 -A16/S3,A17/S4,A18/S5,A19/S6 -BHE/S7 -RD -READY -CLK	30 min
3.	**Conclusion** There are two operating modes for 8086- Minimum mode Maximum mode When only one 8086 is used, it is minimum mode. When it operates in multiprocessor, it is maximum mode.	5 min
4	**Question /Answer** Q **.** What is ALE signal? A. Address Latch Enable Q.What is HLDA? A. hold acknowledgement	5 min

Assignment to be given:-Give the pin diagram of 8086.

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-21

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**B**

S. No.	Topic: - Details Of Eu,Biu And Various Registers	Time Allotted:-
1.	**Introduction** The EU receives opcode of an instruction from the queue ,decodes it and then executes it. The BIU fetches instruction codes from the memory and stores them in a queue. .	10 min
2	**Division of the Topic** -Queue -Pipelining -Decoding Circuitry, timing and control unit -Execution Unit -Registers of 8086	30 min
3.	**Conclusion** While EU executes instructions, the BIU fetches instructions. This type of overlapped operation of functional units of microprocessor is called pipelining.	5 min
4	**Question /Answer** Q . How many instruction byte queues is there? A. Six byte Q. What is function of BIU? A.BIU fetches instruction codes and stores them in a queue.	5 min

Assignment to be given:-What is function of EU and BIU?

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-22

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**B**

S. No.	Topic: -Memory Segmentation	Time Allotted:-
1.	**Introduction** A Segment Register points to the starting address of a memory segment currently being used.	10 min
2	**Division of the Topic** -Code Segment -Data Segment -Stack Segment -Extra Segment	30 min
3.	**Conclusion** The maximum capacity of a segment may be up to 64 Kbytes. The starting address of a segment is divisible by 16.	5 min
4	**Question /Answer** **Q** . What is total memory capacity of 8086? A. 1 Mbyte Q. How many segments are there in 8086? A. four	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-23

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**B**

S. No.	Topic: - Address Computation ,Program Relocation	Time Allotted:-
1.	**Introduction** The actual addresses of 8086 are of 20 bits. It is calculated using the contents of the segment registers and effective memory address.	10 min
2	**Division of the Topic** -Computation of effective address -offset addresses -physical address	30 min
3.	**Conclusion** The effective memory address is computed in variety of ways. It depends on the addressing modes.e.g. The contents of stack pointer and contents of stack segment registers are used to compute the address of the stack location to be accessed.	5 min
4	**Question /Answer** **Q .**How destination addresses for string operations are computed? A. Using the contents of DI and ES. Q.Name the four segments registers of 8086. A. Stack segment, Data segment, Extra segment, Code segment	5 min

Assignment to be given:-Examples on how to calculate 20 bit physical address.

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-24

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND INTERFACING   Section-**B**

S. No.	Topic :-Addressing Modes	Time Allotted:-
1.	**Introduction-** The way by which an operand is specified for an instruction is called addressing mode.	10 min
2	**Division of the Topic** -Register Addressing -Immediate Addressing -Base Addressing -Index Addressing -Direct Addressing -Register Indirect -Based Indexed	30 min
3.	**Conclusion** An instruction performs specific operation on the specified data. The way by which an operand is specified for an instruction called addressing mode.	5 min
4	**Question /Answer** Q .1 What is direct addressing? A. the operand is given in the instruction as an 8-bit or 16 –bit displacement. Q.2 What is base addressing? A. It is the content of bas register BX or BP.	5 min

Assignment to be given:-Explain addressing modes of 8086.

Reference Readings:- MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER
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Lecture Plan-25

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**B**

S. No.	Topic :-Instruction Format	Time Allotted:-
1.	**Introduction-** The instructions of 8086 are much powerful than those of 8085.the 8086 is a general purpose register type processor.	10 min
2	**Division of the Topic** -Instruction Format -Instruction templates -MOD and R/M bit patterns -MOV instruction coding examples	30 min
3.	**Conclusion** We use a template for each basic instruction type and fill in bits to indicate desired addressing mode, data type etc.	5 min
4	**Question /Answer** Q .1 what is W if moving a byte is there? A. W=0 Q .2 what is W if moving a word is there? A. W=1	5 min

Assignment to be given:-Give coding example for move between register and memory location

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-26

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**B**

S. No.	Topic :-Instruction Execution And Timing In 8086	Time Allotted:-
1.	**Introduction-** Bus timing for minimum mode and maximum mode. here the interfacing of the memory and i/o devices are shown with the basic maximum mode configuration .the connections for memory and input /output devices are similar to that of minimum mode configuration .however the generation of control signals from 8086 is done by external bus controller	10 min
2	**Division of the Topic** Minimum mode Maximum mode Bus timing for maximum mode Bus timing for minimum mode Addressing mode	30 min
3.	**Conclusion** Whenever any processor executes an instruction .it performs the specific function/operation on the operand	5 min
4	**Question /Answer** Q .1 what are the different mode of 8086? A . register addressing mode Direct addressing Immediate addressing Register addressing mode Base index mode Register indirect addressing mode	5 min

Assignment to be given:-Give coding example for move between register and memory location

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-27

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**B**

S. No.	Topic :- Instruction Execution Timing Assembler Instruction Format,	Time Allotted:-
1.	**Introduction-** It tells about the instruction set of 8086 and execution timings involved.	10 min
2	**Division of the Topic** -Instruction execution timings -Assembler instruction format	30 min
3.	**Conclusion** The EU takes a definite number of clock periods to calculate the effective address of an instruction.	5 min
4	**Question /Answer** Q .1 How many clock pulses does mov take from register to memory? A. two Q.2 instruction sets of 8086 is classified in how many groups? A. six	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM**

Lecture Plan-28

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND INTERFACING   Section-**C**

S. No.	Topic :- Data Transfer	Time Allotted:-
1.	**Introduction-** Data Transfer involves transfer of a byte or word from the source to destination operand. Arithmetic instructions perform mathematical operations.	10 min
2	**Division of the Topic** -MOV reg,data -PUSH mem/reg -PUSHF -POP mem/reg -POPF -LAHF -SAHF	30 min
3.	**Conclusion** 8086 Performs mathematical operations. Data transfer group transfers a byte or word from source to the destination.	5 min
4	**Question /Answer** Q .1What is POPF? A. Retrieve the top of stack contents to the flag register. Q.2 What is SAHF? A. Store the AH register into the low order byte of the flag register.	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan-29

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

<u>Subject</u>:-MICROPROCESSOR   AND INTERFACING   Section-**C**

S. No.	Topic :- String Data Transfer Instructions	Time Allotted:-
1.	**Introduction-** These instructions copy a byte or a word from a location in the data segment to allocation in the extra segment. The offset of the source byte or word in the data Segment must be in the DI register.	<u>10 min</u>
2	**Division of the Topic** MOVS MOVSB MOVSW REP REPE LODS STOS	<u>30 min</u>
3.	**Conclusion** If the directional flag is zero then SI and DI will be incremented by 1 after move and they will be incremented by 2 after a word move	<u>5 min</u>
4	**Question /Answer** Q .1 OUT INSTRUCTION A . it sends	<u>5 min</u>

<u>**Assignment to be given**</u>:-nil

<u>**Reference Readings:-**</u> **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**
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Lecture Plan -30

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND INTERFACING   Section-**C**

S. No.	Topic :-NOP, HLT& FLAG manipulation instruction	Time Allotted:-
1.	**Introduction** Discussion about the machine control instructions, and the instructions in which flag register is affected.	10 min
2	**Division of the Topic** - NOP - HLT - JC - JNC - JZ/JNZ - JGE/JNL	30 min
3.	**Conclusion** In all these instructions like jump if carry, jump if zero, jump if greater than equal to or jump if not zero jump condition take place according to flag status register.	5 min
4	**Question /Answer** Q .What is JLE? A. jump if less than equal to Q.What is JNGE? A. jump if neither less nor equal	5 min

Assignment to be given:-Explain the conditional jump instructions.

Reference Readings:-
INTEL 8086/8088 MICROPROCESSO ARCHITECTUR,PROGRAMMING,Design AND INTERFACING BY –BHUPINDER CHHABRA
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Lecture Plan -31

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**C**

S. No.	Topic :-LOGICAL, SHIFT AND ROTATE INSTRUCTIONS	Time Allotted:-
1.	**Introduction** These three instructions come under the category of bit manipulation instructions. Logical instructions include like logical AND,OR,XORetc.	10 min
2	**Division of the Topic** - AND ,OR,XOR,Test,Not - SHL,SAL,SAR,SHR - ROL,ROR,RCL,RCR	30 min
3.	**Conclusion** The shift count may be specified as a constant 1 .AF flag is undefined in shift operation.	5 min
4	**Question /Answer** Q .What is SAR? A. Shift arithmetic right. Q.What is RCR? A. Rotate right through carry	5 min

Assignment to be given:-nil

Reference Readings:-INTEL 8086/8088 MICROPROCESSO ARCHITECTURE ,PROGRAMMING, **Design AND INTERFACING BY –BHUPINDER CHHABRA**
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Lecture Plan-32

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**C**

S. No.	Topic :-Introduction To Assembler Directives & Operators	Time Allotted:-
1.	**Introduction** Assembler directives & operators are the instructions to the assembler concerning the program being assembled, they also are called as Pseudo instructions or Pseudo op-codes. These instructions are neither translated into machine code nor assigned any memory locations in the object file.	10 min

2	**Division of the Topic**
	    Assembler
	    Assembler directives:-
	                ORG
	                Define Byte
	                Define double word
	                END
	                LABEL
	                SEGMEN
	                PROC
	    -Operators:-
	                SHORT
	                TYPE
		30min

3.	**Conclusion** These instructions are neither translated into machine code nor assigned any memory locations in the object file.	5 min
4	**Question /Answer** Q.Define DD. A. Double Word ,It creates storage for 32-bit double word variable. Q.Explain ENDP. A. End of Procedure	5 min

Assignment to be given:-Nil
Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER**

Lecture Plan-33

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR   AND   INTERFACING   Section-**C**

S. No.	Topic :- Programming Examples	Time Allotted:-
1.	**Introduction-** Write a assembly language program	10 min
2	**Division of the Topic** Addition of 8-bit 58H and 55 H Division of 32 –bit number Multiplication of two 8-bit	30 min
3.	**Conclusion** Using 8086 program like addition subtraction and multiplication can be done	5 min
4	**Question /Answer** Q1. STC INSTRUCTION A1. sets the carry flag Q2. CMC INSTRUCTION A2. compliments the flag Q3. STD INSTRUCTION A3. sets the directional flag	5 min

Assignment to be given:-nil

Reference Readings:- **MICROPROCESSO ARCHITECTURE ,PROGRAMMING,AND APPLICATION WITH 8085. BY --RAMESH S. GAONKER FUNDAMENTALS OF MICROPROCESSORS AND MICROCOMPUTERS BY—B.RAM**

Lecture Plan-34

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**D**

S. No.	Topic :- Pin Diagram Of 8259 A	Time Allotted:-
1.	**Introduction** The programmable interrupt controller,8259A is a 28 pin IC. . It manages 8 levels of interrupts, can be configured in master-slave or cascade mode to handle up to 64 interrupts. .	10 min
2	**Division of the Topic** a) pin configuration	30min
3.	**Conclusion** It has a bidirectional non multiplexed lines .it has an active low control input line .it is used to read contents of internal register. It has INT and other pins	5 min
4	**Question /Answer** Q1. INT symbol A1. It is an interrupt out put line .it goes high when ever a valid interrupt request is activated.	5 min

Assignment to be given:- nil.

Reference Readings: - MICROPROCESSO ARCHITECTURE, PROGRAMMING, AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan-35

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**D**

S. No.	Topic :- Block Diagram Of 8259 PIC	Time Allotted:-
1.	**Introduction** The programmable interrupt controller,8259A is a 28 pin IC. . It manages 8 levels of interrupts, can be configured in master-slave or cascade mode to handle up to 64 interrupts. .	10 min

2	**Division of the Topic**
	  a) data transfer group
	  b) Read/Write logic
	  c)Cascade buffer
	  d) CL
	  e)ISR
	  f)PR
	  g) IMR
		30min

3.	**Conclusion** The programmable interrupt controller (PIC) functions as an overall manager in an interrupt driven system environment. It accepts requests from the peripheral equipment, determines which of the incoming requests is of the highest priority, ascertains whether the incoming request has a higher priority value than the level currently being serviced, and issues an interrupt to the CPU based on this determination. This IC is compatible with µp 8085,8086 and 8088. .	5 min
4	**Question /Answer** Q. What does IMR stands for ? A Interrupt mask register Q2 what is the working of IMR A. it is a programmable register. It is used to make out unwanted interrupt request	5 min

Assignment to be given:-nil
Reference Readings: - MICROPROCESSO ARCHITECTURE, PROGRAMMING, AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan-36

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**D**

S. No.	Topic :- Programming On Interrupt Controller 8259 PIC	Time Allotted:-
1.	**Introduction** The programmable interrupt controller,8259A is a 28 pin IC. . It manages 8 levels of interrupts, can be configured in master-slave or cascade mode to handle up to 64 interrupts. .	10 min

2	**Division of the Topic**
	 -Command words :-
	             -Initialization Command words (ICWs)
	             -Operation Command words (OCWs)
	 -Priority modes
	 - End of interrupt
	 -Poll command
	 -Buffered mode
		30min

3.	**Conclusion** The programmable interrupt controller (PIC) functions as an overall manager in an interrupt driven system environment. It accepts requests from the peripheral equipment, determines which of the incoming requests is of the highest priority, ascertains whether the incoming request has a higher priority value than the level currently being serviced, and issues an interrupt to the CPU based on this determination. This IC is compatible with µp 8085,8086 and 8088. .	5 min
4	**Question /Answer** Q. How many 8259As are required to have 64 interrupt inputs? A. 9 Q.What is the purpose of IRR in the 8259A. A. The IRR indicates which interrupts level are masked.	5 min

Assignment to be given:-Discuss the various ICWs & OCWs of 8259A.

Reference Readings: - MICROPROCESSO ARCHITECTURE, PROGRAMMING, AND APPLICATION WITH 8085.   BY --RAMESH S. GAONKER
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Lecture Plan -37

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**D**

S. No.	Topic :-Programmable Interval Timer	Time Allotted:-
1.	**Introduction** There are two basic modes of timer delay and counter.To operate a counter a 16- bit counter is loaded in its register and ,one command begins to decrement the count until it reaches 0	<u>10 min</u>
2	**Division of the Topic** Three independent 16- bit down counter Programmable counter modes Counting facility in both binary or BCD number system	<u>30 min</u>
3.	**Conclusion** Operating frequency (DC to 8 MHz and 10 MHz for 8254-2) 24 pin dual in –line package Single + 5V supply	<u>5 min</u>
4	**Question /Answer** Q .What is function delay mode? A . it can provide delay of any value ,but it uses soft ware to implement delay Q What is function counter mode? A .can count the pulses arriving at the port	<u>5 min</u>

Assignment to be given:- nil

Reference Readings:-INTEL 8086/8088_MICROPROCESSO ARCHITECTURE ,PROGRAMMING, **Design AND INTERFACING BY –BHUPINDER CHHABRA**
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Lecture Plan -38

Semester: -Vth   Class:-ECE   Course Code:-EE-309-F

Subject:-MICROPROCESSOR AND INTERFACING   Section-**D**

S. No.	Topic :-Programmable Interval Timer 8253	Time Allotted:-
1.	**Introduction** The 8253 is a programmable counter/timer chip. It is organized as 3 independent 16-bit counters, each with a count rate up to 2 MHz. .	10 min
2	**Division of the Topic** **-**Introduction to Programmable interval timer -Pin Diagram of 8253 - Explanation of pins -Block diagram of 8253	30 min
3.	**Conclusion** 8253 includes three counters (0, 1, and 2), a data bus buffer, read/write control logic, and a control register.	5 min
4	**Question /Answer** Q .What is function of mode 0? A. Interrupt on terminal count Q.What is function of mode 4? A. Software triggered strobe**.**	5 min

Assignment to be given:-Explain the pin diagram of 8253.

Reference Readings:-INTEL 8086/8088 **MICROPROCESSOR** ARCHITECTURE,
PROGRAMMING, Design AND INTERFACING BY –BHUPINDER CHHABRA
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