

**1. Group - A (Short Answer Questions)**

S. No	QUESTION	Blooms Taxonomy Level	Course Outcome
<b>UNIT-I 8086 ARCHITECTURE</b>			
1	Define Microprocessor and give the power supply & clock frequency of 8085.	Remember	1
2	List few applications of microprocessor-based system.	Remember	1
3	Compare 8085 & 8086 microprocessor.	Evaluate	1
4	Demonstrate pipelining.	Understand	1
5	List the allowed register pairs of 8085.	Remember	1
6	List the interrupts of 8085.	Remember	1
7	List features of 8086 microprocessor.	Remember	1
8	Name the functional units of 8086 microprocessor	Remember	1
9	Explain the functions of an accumulator.	Understand	1
10	Explain why 8086 internal architecture is divided into BIU & EU.	Understand	1
11	Discuss the functions of BIU.	Understand	1
12	Demonstrate the functions of EU.	Understand	1
13	Name the registers of 8086.	Remember	1
14	Describe the flag register of 8086.	Understand	1

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15	Demonstrate how physical address is generated in 8086.	Understand	1
16	List advantages of memory segmentation.	Remember	1
17	Evaluate the physical address, if base address is 5200H & offset address is 4510H.	Evaluation	1
18	Explain the physical memory organization of 8086.	Understand	1
19	List the operating modes of 8086.	Remember	1
20	List the minimum mode signals.	Remember	1
21	List the maximum mode signals.	Remember	1
22	Explain ALE, $\overline{BHE}$ /S7, DEN, DT/R.	Understand	1
23	Explain READY, MN/ $\overline{MX}$ HOLD, and HOLDA.	Understand	1
24	Indicate the interrupts of 8086.	Understand	1
25	Categorize the sources of interrupts.	Analysis	1
26	Explain hardware interrupts.	Understand	1
<b>UNIT-II</b>			
<b>INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING</b>			
1	Define addressing mode. Write the names of 8086 addressing modes.	Remember	2
2	Demonstrate about the immediate addressing mode of 8086 with an example.	Understand	2
3	Define & explain the use of relative plus addressing mode.	Remember	2
4	Explain the instructions formats in 8086.	Understand	2
5	Define an instruction, opcode & operands.	Remember	2
6	Demonstrate the following instructions of 8086. a) ADC b) AAS c) IMUL d) CBW	Understand	2
7	Explain the meaning of following instructions. a) MOV BX,[1234H] b) ADC AX,BX	Understand	2
8	Demonstrate the instructions which will not affect flag registers.	Understand	2
9	Explain ESC, NOP & LOCK instructions of 8086.	Understand	2
10	Explain PUSH & POP instructions.	Understand	2
11	Explain XLAT instructions.	Understand	2
12	Describe the 16- bit registers are present in 8086.	Understand	2
13	Distinguish the TEST & logical AND instructions.	Understand	2
14	Explain stack pointer & instruction pointer.	Understand	2
15	Distinguish the ADD & INC instructions.	Understand	2
16	Explain IN & OUT instructions.	Understand	2
17	List any two address transfer instructions.	Analyze	2
18	Give two conditional jump instructions with an example.	Understand	2
19	Explain NEG, COMP instructions.	Understand	2
20	Define assembler directive. Give any two examples.	Remember	2
21	Explain DAA, AAA instructions.	Understand	2
22	Explain MUL, DIV instructions.	Understand	2
23	Explain rotate instructions.	Understand	2
24	Explain Shift instructions.	Understand	2

S. No	QUESTION	Blooms Taxonomy Level	Course Outcome
25	Define Macro with an example.	Remember	2
26	Define Procedure with an example.	Remember	2
27	Analyze the storage allocation directives.	Analyze	2
28	Demonstrate about the alignment directives.	Understand	2
<b>UNIT-III I/O INTERFACE</b>			
1	Explain why I/O interface required for 8086.	Understand	3
2	List the features of the 8255(PPI).	Remember	3
3	Identify how many port lines are present in 8255.	Apply	3
4	Explain how many modes 8255 can be operated.	Understand	3
5	Explain BSR mode of operation.	Understand	3
6	Discuss how many I/O modes of operations present in 8255.	Create	3
7	Discuss the applications of stepper motor.	Create	3
8	Demonstrate the need for ADC.	Understand	3
9	Elaborate the applications of DAC	Create	3
10	List the methods available for ADC.	Remember	3
11	Explain key bouncing.	Understand	3
12	Describe how to eliminate key bouncing.	Understand	3
13	Formulate the control word format for BSR mode.	Create	3
14	Formulate the control word format for I/O mode.	Create	3
15	Choose in which mode of I/O operation Bi-directional data transfer takes place explain.	Create	3
16	Solve the control port address of 8255 if the base address is FFF0H.	Apply	3
17	Explain the function of handshaking signals.	Understand	3
<b>UNIT-IV INTERFACING WITH ADVANCED DEVICES</b>			
1	Distinguish between static and dynamic RAM with examples.	Understand	4
2	Explain the purpose of <del>BHE</del> and A0 pins on the 8086 microprocessor.	Understand	4
3	Define Memory mapped I/O.	Remember	4
4	Define I/O mapped I/O.	Remember	4
5	Explain the purpose of CE or CS pin on a memory chip.	Understand	4
6	Imagine the input for chip select.	Create	4
7	Explain, why the interrupt and trap flags cleared as part of the interrupt response.	Understand	4
8	Explain the interrupt response.	Understand	4
9	Define interrupt vector table.	Remember	4
10	Define interrupt service routine.	Remember	4
11	Compare Maskable and Non-Maskable interrupts.	Understand	4
12	List the interrupts of 8086.	Remember	4
13	Explain the priorities of 8086 interrupts.	Evaluate	4
14	Estimate how many interrupts can be handled by PIC.	Create	4
15	List the uses of int-03 interrupt.	Remember	4

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16	Explain with an example how overflow flag set.	Understand	4
17	Explain what happens when trap flag is set.	Understand	4
18	Define DOS interrupts. Give two examples.	Remember	4
19	Show two examples for BIOS interrupts.	Remember	4
20	List few BIOS functions used for display activation.	Remember	4
21	Demonstrate the need for DMA.	Understand	4
22	List the data transfer schemes available in DMA.	Remember	4
23	Explain the functioning of a) MARK b) HLDA	Understand	4
24	Analyze the registers available in 8257.	Analyze	4
25	Recall the function of DMA address register.	Remember	4
26	Examine the vector address of type 50H interrupt.	Analyze	4
<b>UNIT-V</b>			
<b>COMMUNICATION INTERFACE</b>			
1	Explain why serial data transfer is preferred over parallel data transfer.	Understand	6
2	Define synchronous data transfer.	Remember	6
3	Describe the frame format of serial asynchronous communication.	Understand	6
4	Define modem.	Remember	6
5	Define communication links.	Remember	6
6	Define USART.	Remember	6
7	Discuss the use of 8251 chip.	Create	6
8	List the features of 8251(USART).	Remember	6
9	List the serial communication standards available.	Remember	6
10	Elaborate the most commonly used signals in RS232.	Create	6
11	Describe and sketch the frame format of mode word of 8251.	Understand	6
12	Distinguish between synchronous and asynchronous serial data transmission techniques.	Understand	6
13	Define Baud rate.	Remember	6
14	Imagine the methods available for error correction during serial data transmission.	Create	6
15	Examine the specifications of RS232C.	Analyze	6
16	Explain framing error and over run error in 8251.	Understand	6
17	Define IEEE-488 bus controller.	Remember	6
18	Define IEEE-488 talker & listener.	Remember	6
19	Demonstrate the management signals of IEEE-488 bus.	Understand	6
20	Estimate how many devices can be connected to IEEE-488 bus.	Evaluate	6
21	Define signals of IEEE-488 a) ATN b) EOI c) IFC	Remember	6
22	Describe the status register of 8251.	Understand	6
23	Make use of modem control unit in 8251.	Apply	6
24	Explain a) TXRDY b) DSR signals.	Understand	6
25	Explain a) RTS b) SYNDET/BD signals.	Understand	6
26	Define prototyping.	Remember	6
27	Tell the meaning of trouble shooting.	Remember	6

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<b>UNIT-VI</b>			
<b>INTRODUCTION TO MICROCONTROLLER</b>			
1	Compare microprocessor and microcontroller.	Evaluate	1
2	Demonstrate which ports of 8051 are bit addressable.	Understand	1
3	Explain why Port 0 needs pull-up resistors in 8051.	Understand	1
4	List of 128 bytes of RAM in the 8051, how many bytes are bit addressable? List them.	Remember	1
5	Explain how to save the status of P2.7 in RAM location 31.	Understand	1
6	List the types of addressing modes in 8051 microcontroller.	Remember	2
7	Discuss about I/O port operation in 8051.	Understand	1
8	Explain how external interrupts are serviced in 8051	Understand	1
9	Demonstrate the flag pattern available in 8051.	Understand	1
10	Estimate the value of register A after each of the following instructions. MOV A,#26H RR A RR A RR A SWAP A	Create	5
11	List the on-chip resources available in the 8051 microcontroller.	Remember	1
12	Write the number of register banks in 8051 and say how the CPU knows which bank is currently in use.	Understand	1
13	Explain the controls signals to be used, if 8051 microcontroller demands interfacing of external memory.	Understand	1
14	Elaborate the function of the bits PSW.3 & PSW.4 in 8051.	Create	1
15	Distinguish polling and interrupt mechanism. Find the value of the PSW register after the execution of the instructions. MOV A, #95 ADD A, #120	Analyze	1
16	Explain the use of SFR in 8051.	Understand	1
17	List all the SFRs involved in 8051.	Remember	1
18	Explain addressing modes supported by 8051.	Evaluate	2
19	Show one instruction each using the following addressing modes of 8051. a). Immediate    b). Register c). Register indirect d). Direct	Understand  Create	2
20	List the instructions sets available in 8051.	Remember	2
21	Explain the following instructions in 8051 micro controller. a. SETB 86H b. CLR 87H c. SETB 92H	Understand	5
22	Explain how 8051 differentiates internal and external memory.	Understand	1
23	Analyze the given 8051 instructions: MOVC and MOVX.	Analyze	2
24	Explain the instructions LJMP and SJMP in 8051.	Understand	2
25	Examine the addressing mode used in the following instructions: MOV R1, #02H and MOV R1, 20H	Create	2

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26	Estimate the result of the following code & where it is stored. MOV R4, #25H MOV A, #1FH ADD A, R4	Create	2
27	Estimate the content of register A after the execution of the following code. CLR A ORA A, #99H CPL A	Create	2
28	Show the contents of AC, CY flags if we add 25H and 70H in 8051.	Create	2
<b>UNIT-VII</b>			
<b>8051 REALTIME CONTROL</b>			
1	Explain the format of TMOD & TCON in 8051.	Understand	7
2	Describe the Timer counter logic diagram in 8051.	Understand	7
3	Define serial communication in 8051.	Remember	7
4	List the advantages of serial data transfer in 8051.	Remember	7
5	List the SFRs needed for serial communication in 8051.	Remember	7
6	Explain the use of PCON register in 8051.	Understand	7
7	Describe how serial port is used for data transfer in 8051.	Understand	7
8	List functions of SCON register of 8051.	Remember	7
9	Discuss the different serial data transmission modes in 8051.	Create	7
10	List the interrupts of 8051.	Remember	7
11	Explain what should be loaded in TCON register to start Timer0 & Timer1 in 8051.	Understand	7
12	Explain how many interrupts are there in 8051. And name them.	Understand	7
13	Identify the highest priority interrupt of 8051.	Apply	7
14	Explain which port in 8051 microcontroller is bit addressable.	Understand	7
15	Describe the SCON register in 8051.	Understand	7
16	Model the format of IE register in 8051.	Apply	7
17	Explain under what conditions are the TI and RI bits raised in 8051.	Understand	7
18	Estimate baud rate in mode-1 operation in 8051.	Create	7
<b>UNIT-VIII</b>			
<b>THE AVR RISC MICROCONTROLLER ARCHITECTURE</b>			
1	Compare RISC & CISC architectures.	Analyze	8
2	Describe the family members of AVR microcontroller.	Understand	8
3	Elaborate the functions of ALU.	Create	8
4	List the alternate functions port B of AVR microcontroller.	Remember	8
5	Describe the data memory in AVR microcontroller.	Understand	8
6	Explain the functions of I/O ports in AVR Microcontroller.	Create	8
7	List the classification of AVR microcontrollers.	Analyze	8
8	Review the functional blocks of AVR microcontroller.	Understand	8
9	Explain the function of MCU control & timing unit.	Create	8
10	Define EEPROM of AVR Microcontroller.	Remember	8
11	Tell how many Timers/Counters present in AVR microcontroller.	Remember	8

S. No	QUESTION	Blooms Taxonomy Level	Course Outcome
12	Write the sources of interrupts in AVR microcontroller.	Create	8
13	List the interrupts of AVR microcontroller.	Remember	8
14	Demonstrate about ADC in AVR microcontroller	Understand	8
15	Explain SPI of AVR microcontroller.	Understand	8
16	Examine the function of Watchdog timer of AVR microcontroller.	Analyze	8
17	Explain register file of AVR microcontroller.	Understand	8

## 2. Group - II (Long Answer Questions)

S. No	Question	Blooms Taxonomy Level	Course Outcome
<b>UNIT-I</b>			
<b>8086 ARCHITECTURE</b>			
1	Explain the architecture of 8086 with neat diagram.	Understand	1
2	Compare 8085 & 8086 microprocessors.	Analyze	1
3	Identify the size of 8086 instruction queue and explain how does queue speed up the processing.	Apply	1
4	Explain general purpose & special purpose registers of 8086.	Understand	1
5	Explain the flag register of 8086.	Understand	1
6	Demonstrate memory segmentation & mention its advantages.	Understand	1
7	Describe the 8086 microprocessor pin-diagram.	Understand	1
8	Demonstrate about the functions of the following pins. a) TEST b) RQ/GT0 & RQ/GT1 c) QS0 & QS1 d) S0, S1, S2	Understand	1
9	Explain minimum mode configuration of 8086 microprocessor.	Understand	1
10	Explain minimum mode control signals of 8086.	Understand	1
11	Explain maximum mode configuration of 8086 microprocessor.	Understand	1
12	Explain maximum mode control signals of 8086.	Understand	1
13	Explain the read & write timing diagrams for maximum mode configuration.	Understand	1
14	Explain the read & write timing diagrams for minimum mode configuration.	Understand	1
15	Describe the function of the following signals. a) NMI b) $\overline{LOCK}$ c) $\overline{TEST}$ d) RESET	Understand	1
16	Describe the interrupts of 8086.	Understand	1
<b>UNIT-II</b>			
<b>INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING</b>			
1	Demonstrate the instructions formats of 8086.	Understand	2
2	Explain the various addressing modes of 8086 with examples.	Understand	2
3	Explain Arithmetic instruction set of 8086 with examples.	Understand	2
4	Explain data transfer instructions of 8086 with examples.	Understand	2
5	Distinguish macros & procedures.	Understand	2
6	Discuss short notes on JUMP instructions with examples.	Create	2

S. No	QUESTION	Blooms Taxonomy Level	Course Outcome
7	Explain the following instructions: i. WAIT ii. HLT iii. ESC iv. NOP	Understand	2
8	Discuss the uses of Shift & rotate instructions.	Create	2
9	Distinguish jump & loop instructions.	Analyze	2
10	Discuss short notes on string instructions.	Create	2
11	Make use of logical instructions available in 8086.	Apply	2
<b>UNIT-III I/O INTERFACE</b>			
1	Describe the architecture of 8255 & explain.	Understand	3
2	Explain the I/O modes of operation.	Understand	3
3	Explain the interfacing diagram of 8255 with 8086.	Understand	3
4	Explain BSR mode of operation. Mention its applications.	Understand	3
5	Show BSR control word of 8255 to set pc2 & pc7 & reset them after a time delay. Base address of 8255 is F800H.	Remember	3
6	Explain pin diagram of 8255 PPI.	Understand	3
7	Develop an ALP to interface stepper motor with 8086.	Create	5
8	Explain the control word format of 8255 in I/O & BSR mode.	Understand	3
9	Develop program for 8-bit ADC to sample analog input & store the digital value in memory.	Create	5
10	Develop an ALP to generate square wave.	Create	5
11	Describe the block diagram of successive approximation method and explain.	Understand	3
12	Explain the interfacing diagram of ADC with 8255.	Understand	3
13	Explain how a stepper motor is interfaced to 8086.	Understand	3
14	Explain how a display device interfaced with 8086.	Understand	3
15	show how a 4x4 key board matrix is connected to 8255.	Remember	3
<b>UNIT-IV INTERFACING WITH ADVANCED DEVICES</b>			
1	Explain how the physical memory of 8086 is organized.	Understand	4
2	Explain the interrupt vector table of 8086.	Understand	4
3	Elaborate short notes on interrupt service routine in 8086.	Create	4
4	Construct an Interface of two 4kx8 EPROMS & and two 4kx8 RAM chips with 8086. Select suitable memory map.	Create	4
5	Explain about the programmed I/O & interrupt driven I/O.	Understand	4
6	Explain the interrupt sequence in 8086 system.	Understand	4
7	Compose short notes on 5 types of interrupts supported by 8086.	Create	4
8	Discuss the architecture of 8259 with neat block diagram.	Create	4
9	Explain the working of 8257 DMA controller.	Evaluate	4
10	Discuss short notes on DOS interrupts.	Create	4
11	Analyze BIOS interrupts.	Analyze	4
12	show how to interface 8259 with 8086.	Remember	4
13	Describe the status register of 8257.	Understand	4
14	Explain the following terms with reference to 8259: (a) END of interrupt (b) Automatic rotation (c) poll command	Understand	4
<b>UNIT-V COMMUNICATION INTERFACE</b>			
1	Describe the 8251 with neat block diagram.	Understand	6
2	Tell how 8251 is used for serial communication of data.	Remember	6



S. No	QUESTION	Blooms Taxonomy Level	Course Outcome
3	Explain the advantages of using the USART chips in microprocessor based systems.	Understand	6
4	Show the types of serial communication.	Understand	6
5	Explain the interfacing of 8251 with 8086 with necessary circuit diagram.	Understand	6
6	Demonstrate the data transmission standards and their specifications.	Understand	6
7	Compose MODEM control lines and explain the functioning of each line.	Create	6
8	Explain the pin structure of RS232C & also discuss about voltage & current specifications of RS 232C.	Understand	6
09	Describe the logic diagram to convert TTL to RS232C conversion and RS232C to TTL conversion.	Understand	6
10	Discuss short notes on IEEE-488 GPIB.	Create	6
<b>UNIT-VI</b>			
<b>INTRODUCTION TO MICROCONTROLLER</b>			
1	Demonstrate the register set of 8051 and also discuss how memory and I/O addressing is done in 8051.	Understand	1
2	Demonstrate internal architecture of 8051 microcontroller in detail.	Understand	1
3	Express the five addressing modes of 8051 microcontroller with example.	Understand	2
4	Construct and illustrate how to access external memory devices in an 8051 based system.	Create	1
5	Demonstrate the internal memory organization of the 8051 microcontroller.	Understand	1
6	Design an 8051 based system with 16 K bytes of program ROM and 16 K bytes of data ROM.	Create	1
7	Illustrate the memory organization and special function registers in 8051 microcontroller.	Understand	1
8	Review the JMP & CALL instructions available in 8051.	Understand	2
9	Describe the operation of I/O ports in 8051 with neat sketch.	Understand	1
10	Utilize the functioning of A & B registers of 8051.	Apply	1
11	Give the format of PSW register of 8051 and explain each bit.	Understand	1
<b>UNIT-VII</b>			
<b>8051 REALTIME CONTROL</b>			
1	Show in detail the various modes of operation of timers in 8051.	Understand	7
2	Express about external hardware interrupt in 8051.	Understand	7
3	Illustrate about the serial communication in 8051 microcontroller.	Understand	7
4	Label the format of IE & IP formats & explain.	Remember	7
5	Explain the function and operating modes with the associated registers of Timer/Counter in 8051 microcontroller.	Understand	7
6	Formulate the sequence of events that takes place when the interrupt occurs in 8051.	Create	7
7	Examine the various SFRs you need while handling the timers/counters. Give the register formats.	Analyze	7

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8	Explain the various modes of serial port in 8051.	Understand	7
9	Show the format & bit definitions of SCON register in 8051.	Understand	7
10	Describe the TCON and TMOD registers of 8051.	Understand	7
<b>UNIT-VIII</b>			
<b>THE AVR RISC MICROCONTROLLER ARCHITECTURE</b>			
1	Distinguish between Tiny, Mega & X mega series of AVR microcontroller.	Understand	8
2	Define the concept of register file. How it is implemented in AVR microcontrollers.	Remember	8
3	List the various data byte operations can be performed by ALU of AVR microcontrollers.	Remember	8
4	Describe the data memory organization of AVR microcontroller.	Understand	8
5	List the SFRs used by timers of AVR microcontroller.	Remember	8
6	List the alternate functions of I/O ports in AVR microcontroller.	Remember	8
7	Describe the modes of operations of timer 0/counter 0 of AVR microcontroller.	Understand	8
8	Explain the functional differences between timer 0 & timer 2 of AVR microcontroller.	Understand	8
9	Describe how input capture facility is implemented in AVR microcontroller.	Understand	8
10	List the features of USART available in AVR microcontroller.	Remember	8
11	Describe the baud generator of AVR microcontroller.	Understand	8
12	Indicate how many control & status registers are used by USART & AVR microcontrollers. Give the format of each and explain.	Understand	8
13	Explain the details of interrupt handling and response of AVR microcontroller on occurrence of interrupt.	Evaluate	8
14	Describe the interrupt vectoring available in AVR microcontrollers.	Understand	8
15	Explain the functions of SFRs used by EEPROM of AVR microcontroller.	Understand	8

### 3. Group - III (Analytical Questions)

S.No	QUESTIONS	Blooms Taxonomy Level	Course Outcome
<b>UNIT-I</b>			
<b>8086 ARCHITECTURE</b>			
1	Solve 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.	Apply	1
2	Examine the physical address is represented by i) 4370:561EH ii) 7A32:0028H	Analyze	1

S.No	QUESTIONS	Blooms Taxonomy Level	Course Outcome
3	Evaluate the physical address of the top of the stack? If the stack segment register contains 3000h and the stack pointer register contains 8434H.	Evaluation	1
4	Inspect the memory address of the next instruction executed by the microprocessor, when operated in the real mode, for the following CS:IP combinations: a) CS = 1000H and IP = 2000H b) CS= 2000h and IP=10000h	Analyze	1
<b>UNIT-II</b>			
<b>INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING</b>			
1	Develop a program to read ASCII code after a strobe signal is sent from a Keyboard.	Create	5
2	Develop a program to add a profit factor to each element in a cost array and puts the result in a prices array.	Create	5
3	Develop an ALP for add a 5-byte number in one array to a 5 byte in another array. Put the sum in another array. Put the state of the carry flag in byte 6 of the array that contains the sum. The first value in each array is the least significant byte of that number.	Apply	5
4	Develop a delay loop which produces a delay of 500µsec on an 8086 with 5-MHz clock.	Apply	5
5	Develop an assembly language program to find factorial of a given number.	Create	5
6	Develop an assembly language program to find sum of squares.	Apply	5
7	Develop an assembly language program to find number of positive & negative numbers from a given array.	Apply	5
8	Develop an assembly language program to convert ASCII to BCD.	Apply	5
9	Develop an ALP to find cube of an 8-bit hexadecimal number.	Create	5
10	Develop an ALP to display 'IARE MPMC LAB' on the screen.	Apply	5
11	Develop an ALP to convert a given sixteen bit binary number to its gray equivalent.	Create	5
<b>UNIT-III</b>			
<b>I/O INTERFACE</b>			
1	Model a Control Words When the Port Of Intel 8255A defined as follows: Port A as an O/P port, mode of the port a is mode-0, port B as an O/P port, mode of the Port B is mode-0.	Apply	3
2	Construct an Interfacing DAC AD7523 with an 8086 CPU running at 8MHZ and write an assembly language program to generate a saw tooth waveform of period 1ms with Vmax 5V.	Create	3 & 5
3	Develop an ALP for stepper motor interfacing by using loop instructions.	Create	5
<b>UNIT-IV</b>			
<b>INTERFACING WITH ADVANCED DEVICES</b>			
1	Construct an interface two chips of 32k × 8 PROM & four chips of 32k × 8 RAM with 8086, according to the following map. ROM 1 & 2 F0000H-FFFFFH, RAM 1 & 2 D0000H-DFFFFH RAM 3 & 4 E0000H-EFFFFH. Show the implementation of this memory system.	Create	4

S.No	QUESTIONS	Blooms Taxonomy Level	Course Outcome
2	Develop a Program for 8086 to service a real time clock in interrupt. 8259 is connected to 8086 and free running clock of 1Hz is given as interrupt request to IR2. 8259 to be programmed for following specifications: a) IR2 is edge triggered interrupt b) non-specific EOI, fully nested mode c) Interrupt type 60H for IRO d) Mask all other interrupt requests.	Create	4 & 5
3	Plan how 8257's are cascaded to provide more number of DRQ's and explain the operation.	Application	4
4	Demonstrate about interrupt priority schemes used in 8259.	Understand	4
5	Develop an instruction sequence that will cause the priority of an 8259, whose even address is 0800H, to be IR5,IR6, IR7, IRO, IR1, IR2, IR3, IR4. Solve this problem when the current interrupt priority is IR1 and for the second time assuming the current priority to be IR7.	Create	4
<b>UNIT-V</b>			
<b>COMMUNICATION INTERFACE</b>			
1	Illustrate the status register of 8251 for the given statement. Read status register and wait for DSR and TxRDY to become active. One active, get character from PC keyboard using INT B8H (keyboard routine).	Analyze	6
2	Develop an ALP for to transfer the data serially by using 8086.	Create	6
3	Identify the errors in receiving the data from asynchronous mode of operation using 8251.	Understand	
4	Imagine the sequence of instructions required to initialize 8251 at address A0H and A1H for the configuration below. i) Character length – 8 bits ii) No parity iii) Stop bits – 2 iv) Baud rate – 16 X v) Error flag is reset vi) DTR and RTS asserted	Create	6
5	Develop an 8086 instruction sequence for receiving 50 characters using 8251 and store them in memory at location 2080H.	Create	5 & 6
<b>UNIT-VI</b>			
<b>INTRODUCTION TO MICROCONTROLLER</b>			
1	Develop 8051 program to convert packed BCD number available in accumulator, into two ASCII numbers and save them in internal RAM locations 48H and 49H.	Create	5
2	Develop 8051 program to move a block of data from external program memory to external data memory.	Create	5
3	Choose PUSH instruction to put the number 82H in RAM locations 34H to 37H. Also write same program without PUSH instruction.	Apply	5
4	Develop and elaborate 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.	Create	5
5	Develop 8051 program to OR the contents of port 1 and port 2, put the result in external RAM location 0102h.	Create	5

S.No	QUESTIONS	Blooms Taxonomy Level	Course Outcome
<b>UNIT-VII</b> <b>8051 REALTIME CONTROL</b>			
1	Indicate when the TF0 flag is raised for the following program. MOV TMOD, #01H MOV TL0, #12H MOV TH0, #1CH SETB TR0 Assume XTAL = 11.0592MHz.	Understand	7
2	Examine the TH1, TL1 value to generate a time delay of 5ms. Timer 1 is programmable in mode 1 using 8051. Assume that XTAL = 16MHz.	Analyze	7
3	Develop a Program for Timer 1 to generate a square wave of 1 kHz in 8051. Assume that XTAL = 11.0592MHz.	Create	5
4	Develop a Program for Program Timer-0 go generate a square wave of 3 kHz in 8051. Assume that XTAL = 11.0592MHz.	Create	5
5	Indicate which mode and which timers are selected for each of the following. a) MOV TMOD, #01H      b) MOV TMOD, #20H      c)      MOV TMOD, #12H	Understand	7
6	Explain which bits in which registers must be set to 1 to have timer 0 count input pulses on pin T0 in timer mode 0.	Understand	7
<b>UNIT-VIII</b> <b>AVR Microcontroller</b>			
1	Elaborate various sources of interrupts in AT90S2313 microcontroller.	Create	8
2	Describe the various flags of status registers of AT90S2313 microcontroller.	Understand	8