Total Pages: 1

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: CS305

Course Name: MICROPROCESSORS AND MICROCONTROLLERS (IT, CS)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		List the registers used in 8086 microcontroller.	(3)
2		Describe function of the following signals of 8086. i) INTR ii) READY iii) HOLD	(3)
3		State the significance of assembler directives in an assembly language program with suitable examples?	(3)
4		Compare macro and subroutine?	(3)

PART B

Answer any two full questions, each carries 9 marks.

5		Draw and explain the internal block diagram of 8086.	(9)
6		What are the different addressing modes supported by 8086? Give explanation with suitable examples.	(9)
7	a)	Give the architectural and signal differences between 8086 and 8088?	(4)
	b)	Write an assembly language program to find the largest number from an unordered array of 8-bit numbers?	(5)

PART C

Answer all questions, each carries 3 marks.

8		Describe interrupt cycle of 8086/88 with neat diagram.	(3)
9		Give description of the following interrupts: (i) Non maskable (ii) Maskable	(3)
10		Compare I/O mapped interfacing and memory mapped interfacing.	(3)
11		Mention the salient features of basic I/O mode operation of 8255.	(3)

PART D

Answer any two full questions, each carries 9 marks.

12	a)	Interface two 4K x 8 EPROMs and two 4K x 8 RAM chips with 8086. Select suitable address maps.	(6)
	b)	Give a brief description about interrupt service routine.	(3)
13		Draw the internal architecture of 8259 and explain.	(9)
14		Describe different modes of operation of the following peripheral ICs: i) 8255 ii) 8279	(6)

PART E

Answer any four full questions, each carries 10 marks.

15	a)	What are the different types of microcontrollers?	(5)
	b)	What factors are needed to be considered for selecting a microcontroller?	(5)
16		Give brief description of memory and I/O addressing of 8051.	(10)
17		What are different addressing modes supported by 8051?	(10)
18		Draw the internal architecture of 8051 with brief description.	(10)
19		Draw and explain the internal architecture of 8254/8253.	(10)
20		Write an 8051 based assembly language program to perform addition of two 2x2 matrices.	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CS305

Course Name: MICROPROCESSORS AND MICROCONTROLLERS (CS, IT)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks

		Marks
1	What are the different flag bits available within the flag register of 8086?	(3)
2	With the help of a timing diagram show the transition of control signals involved in the I/O read operation of 8086 in minimum mode.	(3)
3	With the help of an example state the differences in the functioning aspects of the instructions SHR and SAR of 8086.	(3)
4	Describe any three addressing modes used in 8086.	(3)

PART B

Answer any two full questions, each carries 9 marks

5	Explain the physical and logical memory organization of 8086?	(9)
6	What are the different techniques of passing parameters to subroutines in assembly language programs? Give the detailed description.	(9)
7	Write an 8086assembly language program to check whether a string is palindrome or not. Assume that the string and its length are stored at known memory locations.	(9)

PART C

Answer all questions, each carries 3 marks

8	What are the disadvantages of polling scheme over interrupt scheme?	(3)
9	What is an Interrupt Vector Table (IVT)? Provide a diagrammatic representation of the IVT of 8086.	(3)
10	What are the three different I/O modes supported by 8255?	(3)
11	What is DMA? State the sequence of operations performed by a DMA controller in a DMA transfer operation.	(3)

PART D

Answer any two full questions, each carries 9 marks

12		With the help of a diagram explain the different blocks of 8259 Programmable Interrupt Controller.	(9)
13		What are the different operational modes of 8279?	(9)
14	a)	What are the five dedicated interrupts of 8086?	(5)

b) List any four features of 8257 DMA Controller. (4)

PART E

Answer any four full questions, each carries 10 marks

15 a) What is a microcontroller? Distinguish between a microcontroller and a microprocessor. (5)

b) What are the five different addressing modes available in 8051 microcontroller? (5)

16 With the help of a block diagram describe the different components of 8051. (10)

17 Consider four LEDs connected to the lower 4 bits of Port P0 of 8051 microcontroller. Assume that the LEDs shall glow if the corresponding bit is 1. Write an 8051 program which makes the group of LEDs to function as 4-bit Ring Counter. The program should iterate to display the Ring Counter sequence five times continuously and then exit. (Hint: 4bit Ring Counter sequence is 1000, 0100, 0010, 0001) (10)

18 Describe the architecture and functionalities of 8253 interval timer. (10)

19 What are the five different categories of 8051 instruction set? Explain each category with appropriate examples. (10)

20 a) What are the five different interrupts in 8051? (5)

b) Write an 8051 program to find the sum of digits of an 8bit unsigned decimal number. (5)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: CS305

Course Name: MICROPROCESSORS AND MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1		How does the 8086 processor access a word from an odd memory location? Howmany memory cycles does it take?	(3)
2		Find the physical address of the destination operands referred in the following instructions, if DS=0223H, DI=0CCCH and SI=1234H a) MOV [DI], AL b) MOV [SI][56H], BL	(3)
3		What is the difference in the execution of an 8086 inter-segment and intra-segment CALL instruction?	(3)
4		Define the functions of the following 8086 assembler directives: a) ASSUME b) EQU c) OFFSET	(3)

PART B

Answer any two full questions, each carries 9 marks.

5		Draw the Memory Read timing diagram of 8086 in Minimum mode. Describe the status of the relevant signals during each clock period.	(9)
6		Explain the addressing modes supported by 8086 with one example for each.	(9)
7		Write an 8086 assembly language program to find the count of even and odd numbers from a set of 10 sixteen bit numbers stored in location staring from a known address. Store the results in two different locations.	(9)

PART C

Answer all questions, each carries 3 marks.

8		Write the condition(s) which cause 8086 to perform a Type 1, Type 2 and Type 3 interrupts.	(3)
9		Discuss 8086 interrupt acknowledgement cycle.	(3)
10		Differentiate between I/O mapped I/O and memory mapped I/O.	(3)
11		Write short notes on scanned keyboard mode with 2-key lockout of 8279 keyboard/display controller.	(3)

PART D

Answer any two full questions, each carries 9 marks.

12		Draw the architectural block diagram of 8259 Programmable Interrupt Controller and explain the role of each functional part.	(9)
13	a)	What do you mean by Interrupt Vector Table (IVT)? The starting address for a type 7 interrupt-service procedure is 1112:1314. Show where and in what order this address should be placed in the 8086 IVT.	(5)
	b)	Briefly describe the control word format of 8255 PPI.	(4)
14		Design an interface between 8086 CPU and two chips of 16 x 8 EPROM and two chips of 32K x 8 RAM. Select the starting address of EPROM suitably. The RAM address must start at 00000H.	(9)

PART E

Answer any four full questions, each carries 10 marks.

15	a)	Discuss the selection criteria of a typical microcontroller.	(4)
	b)	Explain about the programmable I/O ports of 8051 microcontroller.	(6)
16	a)	How the 8051 differentiate between internal and external program memory?	(1)
	b)	Discuss the structure of internal data memory (RAM) of 8051.	(5)
	c)	What is the size of 8051 Stack Pointer (SP)? Discuss the operation of 8051 stack.	(4)
17	a)	Describe the program status word (PSW) of 8051.	(3)
	b)	How many interrupts have been provided in 8051? Explain the necessary conditions which cause these interrupts to be generated. Also arrange them in the decreasing order of priority.	(7)
18		Describe the addressing modes of 8051 with one example for each.	(10)
19	a)	What is the difference between LCALL and ACALL instructions?	(2)
	b)	Write an 8051 assembly language program to find the largest of ten numbers stored in RAM location 47H onwards. Output the result in port1.	(6)
	c)	Is "DIV A, R1" a valid instruction? Justify your answer.	(2)
20		Explain the architecture and modes of operation of 8254/8253 programmable Timer/ Counter with necessary diagrams.	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: CS305

Course Name: MICROPROCESSORS AND MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks. Marks

1 Draw the timing diagram for the 8086 minimum mode memory write operation. (3)

2 With an example describe the register and register relative addressing mode of 8086. (3)

3 List any six features of 8088 microprocessor. (3)

4 Describe the use of 8086 instructions: PUSH, POP and PUSHF (3)

PART B

Answer any two full questions, each carries 9 marks.

5 a) With a neat diagram describe how 8086 memory is organised at physical level. (5)

b) With the help of an example show how stack can be used for passing parameters to a subroutine in assembly programs. (4)

6 a) Write an 8086 assembly program to find the largest number from a list of numbers. (9)

7 a) What are assembler directives? List any four assembler directives and its usage. (5)

b) What are the different information conveyed by the Queue status signals QS0 and QS1 of 8086 in maximum mode? (4)

PART C

Answer all questions, each carries 3 marks.

8 What are the basic categories of 8086 software interrupts? (3)

9 Describe the control word format for the BSR mode of 8255. (3)

10 What is an Interrupt Service Routine? How do we get the address of the ISR corresponding to a given interrupt in 8086? (3)

11 What are the purposes of the signals DRQ, TC and MARK in 8257? (3)

PART D

Answer any two full questions, each carries 9 marks.

12 With a neat diagram describe how 8259 can be used for handling multiple interrupts? (9)

13 With a neat diagram describe the architecture of 8255. (9)

14	a)	What are the different input modes of 8279?	(5)
	b)	Describe the sequence of steps for developing and deploying an ISR for handling interrupt in 8086.	(4)

PART E

Answer any four full questions, each carries 10 marks.

15	a)	Describe different types of microcontrollers.	(5)
	b)	What are the different criteria that should be considered while selecting a microcontroller?	(5)
16	a)	What are the different operating modes of 8253?	(6)
	b)	Describe any four control transfer instructions of 8051?	(4)
17	a)	What are the Special Purpose Registers of 8051?	(4)
	b)	Write the structure of Program Status Word (PSW) of 8051?	(3)
	c)	How the stack operations of 8051 differ from 8086?	(3)
18		Write an 8051 program to count the number of 1s in the binary representation of a given number.	(10)
19		Explain the internal memory organization of 8051.	(10)
20	a)	Explain any five addressing modes of 8051 with example.	(5)
	b)	What is the use of following 8051 instructions : ADDC, SUBB, CPL, RLC and SWAP?	(5)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

Course Code: CS305

Course Name: MICROPROCESSORS AND MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks. Marks

1		Find the physical address of the memory locations referred by the following instructions, when DS=BCOOH, SI=0023H, BX=0012H a)MOV AL,[SI] b) MOV [BX][SI],DL	(3)
2		What are the differences between 8086 and 8088 microprocessors?	(3)
3		Explain the following addressing modes of 8086 with suitable examples. a) Immediate b)Register Indirect	(3)
4		Explain the differences between 8086 procedure call and macro call	(3)

PART B

Answer any two full questions, each carries9 marks.

5		Explain minimum mode configuration of 8086.	(9)
6		Explain register set of 8086.	(9)
7		Write an 8086 assembly language program to find the sum of all numbers less than 50 in an array of n numbers.	(9)

PART C

Answer all questions, each carries3 marks.

8		Explain IO port address decoding with an example.	(3)
9		Explain the events performed in 8086 when an interrupt occurs.	(3)
10		What is the mode and I/O configurations for various ports in 8255 after its control register is loaded with 86H.	(3)
11		Explain how the INT n instruction finds the starting address of its interrupt service routine	(3)

PART D

Answer any two full questions, each carries9 marks.

12		Explain the block diagram of 8259, priority interrupt controller.	(9)
13		Interface 32Kx8 RAM using four numbers of 8Kx8 memory chips and 16Kx8 ROM using two numbers of 8Kx8 EPROM chips. The address map is given as RAM starts at 00000H and ROM ends at FFFFFH.	(9)
14	a	Explain the features of 8257, DMA controller.	(4)

b What are the differences between peripheral I/O and memory mapped I/O schemes (5)

PART E

Answer any four full questions, each carries10 marks.

15 a) What are the differences between microprocessors and microcontrollers? (4)

b) Explain programmable IO ports of 8051 microcontroller. (6)

16 Explain the architecture of 8051 microcontroller using block diagram. (10)

17 Explain the architecture of 8254/8253 programmable timer using block diagram. (10)

18 a) Describe the factors that affect the selection of processor for a microcontroller based design. (5)

b) Explain the working of stack of 8051 microcontroller. (5)

19 Explain addressing modes of 8051 microcontroller. (10)

20 a) Write an 8051 microcontroller assembly language program to check whether the given 8-bit number has odd number of ones. (6)

b) Explain the working of the following instructions with suitable example. (4)

a) MOVX b) XCHD c) AJMP d) SWAP

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: CS305

Course Name: MICROPROCESSORS AND MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks.

			Marks
1		Explain logical memory organization of 8086.	(3)
2		Explain memory read operation in minimum mode of 8086 with the help of a timing diagram.	(3)
3		Explain the usage of the following assembler directives with suitable example. a) EQU b)SEGMENT c)ASSUME	(3)
4		Explain the working of the following instructions with suitable example. a) IN b)SAR	(3)

PART B

Answer any two full questions, each carries9 marks.

5		Write an 8086-assembly language program to find even numbers from an array of n, 8-bit numbers and store the even numbers in a separate array.	(9)
6		Explain maximum mode configuration of 8086 microprocessor	(9)
7	a)	Differentiate 8086 and 8088 microprocessors.	(4)
	b)	Explain 8086 macro definition and macro call with suitable example.	(5)

PART C

Answer all questions, each carries3 marks.

8		Explain various categories of interrupts available in 8086.	(3)
9		Explain the interfacing of an IO device to 8086 using peripheral IO method.	(3)
10		Explain how the priority resolver block of 8259 select the request to be served next.	(3)
11		Explain output modes of 8279, programmable keyboard/display interface.	(3)

PART D

Answer any two full questions, each carries9 marks.

12	a	Explain the Mode 2 operation of 8255.	(5)
	b	What are the activities done by 8086 on receiving an interrupt request?	(4)
13	a	What is meant by maskable and non-maskable interrupts?	(3)
	b	Write the role of 8259A, Programmable Interrupt Controller.	(6)

14 Interface two numbers of 16Kx8 EPROM and 2 numbers of 4Kx8 RAM to 8086. Select suitable address map. (9)

PART E

Answer any four full questions, each carries10 marks.

15 Describe Internal data memory organization of 8051 microcontroller. (10)

16 a) Explain PSW of 8051 microcontroller (5)

b) Explain how external memories can be interfaced to 8051 microcontroller (5)

17 a) Explain the organization of stack in 8051 microcontrollers. (5)

b) Explain the sources of interrupts of 8051 microcontroller. (5)

18 a) What is the role of IE and IP registers of 8051 microcontroller (5)

b) Describe the following instructions of 8051 microcontroller. (5)

a) AJMP b) SJMP c) XCHD d) MOVX e) SWAP

19 a) Write an 8051 assembly language program to count the occurrence of a given byte in a sequence of n bytes. (7)

b) Write the criteria for selecting a microcontroller. (3)

20 a) Explain the block diagram of 8254, programmable interval timer. (6)

b) Explain the following addressing modes of 8051 microcontroller. (4)

a) Register indirect b) Indexed

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