GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2021
MICROPROCESSOR AND MICROCONTRILLER (Backlog)
CS602

TIME ALLOTTED: 3HR   **FULL MARKS:70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any *ten* from the following, choosing the correct alternative of each question: **10×1=10**

		Marks	CO No.
1 (i)	PSW is a ………. Register	1	CO1

a) 8 bit
b) 16 bit
c) 32 bit
d) 20 bit

(ii)	In order to enable TRAP interrupt, which of the following instructions is /are needed?	1	CO1

a) EI only
b) SIM only
c) EI & SIM
d) None of the mentioned

(iii)	If current content of register D is 00_H, then after execution of the instruction **DCR D** the content of D will be	1	CO2

a) 01_H
b) $0F_H$
c) $F0_H$
d) neither 01_H nor $0F_H$ nor $F0_H$

(iv)	Register pair used to indicate memory	1	CO1

a) B and C
b) D and E
c) H and L
d) A and F

(v)	A single instruction to clear the lower four bits of the accumulator in 8085 microprocessor is	1	CO2

a) XRI OFH
b) ANI OFH
c) XRI FOH
d) ANI FOH

(vi)	The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?
	    a) Memory cycle
	    b) Instruction cycle
	    c) Clock cycle
	    d) Machine cycle
		1	CO3

(vii)	Apart from arithmetic operations ,RAL/RAR are useful for
	    a) DMA Controlling
	    b) Serial data transfer
	    c) Decimal adjust operations
	    d) Parallel data transfer
		1	CO5

(viii)	Address lines required for 32K byte memory chip are
	    a) 13
	    b) 14
	    c) 15
	    d) 16
		1	CO1

(ix)	What will be content of Z flag and P flag if result is all 0 after any arithmetic instruction?
	    a) Z=0, P=0
	    b) Z=0, P=1
	    c) Z=1, P=0
	    d) Z=1, P=1
		1	CO2

(x)	The Segment and Offset address of the instruction to be executed by 8086 microprocessor are pointed by
	    a) CS AND SI
	    b) DS and IP
	    c) CS and SP
	    d) CS and IP
		1	CO1

(xi)	Which one of the following is the software interrupt of 8085 Microprocessor?
	    a) RST 0
	    b) RST 7.5
	    c) TRAP
	    d) INTR
		1	CO1

(xii)	Which of the following instruction is not possible in 8085?
	    a) POP PSW
	    b) POP B
	    c) POP D
	    d) POP 30_H
		1	CO2

GROUP – B
(Short Answer Type Questions)
(Answer any *three* of the following)   **3 x 5 = 15**

				Marks	CO No.
2.	(a)	How is PUSH B instruction executed? Find the status after the execution.		3	CO3
	(b)	Draw PSW of 8085.		2	CO2

3. (a) Write down the differences between vector and non vector interrupt with example.   3   CO3

   (b) What is the function of ALE in 8085 µp?   2   CO1

4. (a) **MVI A 67**
MVI B 48
ADD B
XRA A
HLT
What is the content of accumulator after the execution of the above program?   2   CO2

   (b) Write an assembly language program to set all bits of Flag Register of 8085 µp.   3   CO2

5. What is the difference between MAX mode and MIN mode operation in 8086 µp?   5   CO1

6. (a) What are RIM & SIM?   1   CO1

   (b) Explain the function of RIM & SIM.   4   CO1

GROUP – C
(Long Answer Type Questions)
Answer any *three* from the following   **3 × 15 = 45**

                                                      Marks   **CO No.**

7. (a) Describe the sequence of events done in the execution of the following instruction: **91FE: CALL 8A75**   4   CO2

   (b) What are the main function performed by BIU and EU operational unit of 8086 µp?   8   CO1

   (c) What do you mean by instruction cycle, machine cycle and T-states?   3   CO1

8. (a) How pipelining achieved in 8086 microprocessor?   3   CO1

   (b) Draw the timing diagram of op-code fetch machine cycle.   4   CO3

   (c)   4   CO3
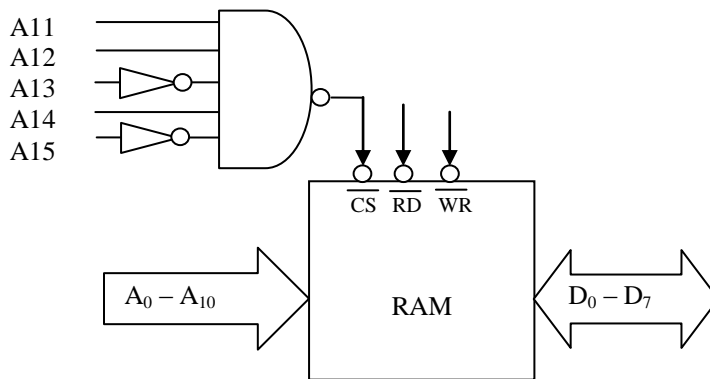
Find out the address range for this RAM chip.

   (d) Describe the different addressing modes of 8086 µp.   3   CO1

   (e) Give an example of Hardware non-vectored interrupt in 8085.   1   CO1

9.

Memory Address in Hex	Mnemonics in HEX
9000	LXI SP, FFFF
9003	LXI B, 1234
9006	MVI A, 05
9008	CALL A010
900B	MOV B, A
900C	HLT
A010	PUSH B
A011	POP PSW
A012	MVI B,12
A014	ADD B
A015	RET

(a)	Write down the content of PC before CALL instruction.	2	CO2
(b)	Write down the content of stack & SP after execution of CALL.	2	CO2
(c)	What happen when RET instruction is executed?	2	CO2
(d)	What happen when PUSH instruction is executed?	2	CO2
(e)	What is the value of PC after execution of CALL instruction?	2	CO2
(f)	Calculate the total execution time of above program if CLK frequency is 3MHz?	5	CO2
10. (a)	Write an assembly language program to find minimum of a series of numbers. The length is given in the location 913F and the series itself starts from 9140. Store the result at 9160.	5	CO2
(b)	Explain **CMA, CMP, CM, XRA, LDAX** instruction with proper example	5	CO2
(c)	Calculate the time delay incurred in the following delay routine:	5	CO2

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          LXI B, 2358
LOOP:        DCX B
        MOV A, C
        ORA B
        JNZ LOOP
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Assume the microprocessor has an operating frequency 2 MHz.

11.	Short note (Answer any three)	5×3=15	
(a)	Memory write cycle	5	CO3
(b)	Queue Structure in 8086 Microprocessor.	5	CO1
(c)	Hardware vs Software Interrupts.	5	CO1
(d)	Demultiplexing of the bus AD_7-AD_0 in 8085 Microprocessor	5	CO1
(e)	Addressing modes of 8051 Microcontroller	5	CO1