GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2022
MICROPROCESSOR AND MICROCONTRILLER
CS602

TIME ALLOTTED: 3 HOURS **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)	A single instruction to clear the lower four bits of the accumulator in 8085 microprocessor is a) XRI OFH b) ANI OFH c) XRI FOH d) ANI FOH	1	CO2
	(ii)	The instruction **XCHG** exchanged the contents of a) Accumulator & H b) DE-pair & HL pair c) BC-pair & HL pair d) HL-pair & memory location	1	CO2
	(iii)	The number of programmable 8-bit register of 8085 microprocessor is a) 5 b) 6 c) 7 d) 8	1	CO1
	(iv)	In order to enable TRAP interrupt, which of the following instructions is /are needed? a) EI only b) SIM only c) EI & SIM d) None of the mentioned	1	CO1
	(v)	What is the vector call location of the non-maskable interrupt of 8085? a) 0000_H b) 0024_H c) 0020_H d) 0034_H	1	CO1

(vi) Full form of PSW is — 1 — CO1
a) Program Specific Word
b) Program Status Word
c) Processor Status Word
d) Processor Specific Word

(vii) 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 $F0_H$

(viii) Which one of the following is the non-vectored interrupt of 8085 microprocessor? — 1 — CO1
a) TRAP
b) EI
c) INTR
d) RIM

(ix) T-States in 'CALL' instruction of 8085 MPU are — 1 — CO3
a) 13
b) 18
c) 10
d) 7

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

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

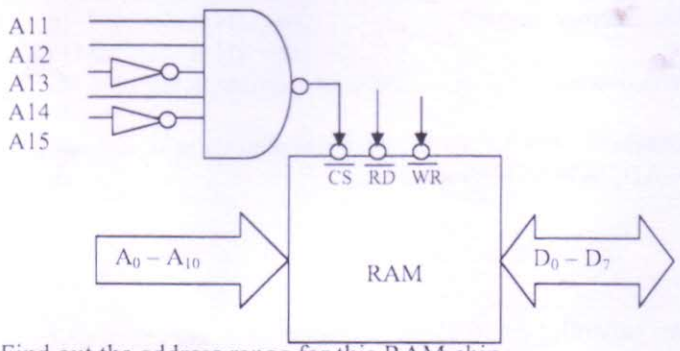
(xii) The Segment and Offset address of the instruction to be executed by 8086 microprocessor are pointed by — 1 — CO1
a) CS AND SI
b) DS and IP
c) CS and SP
d) CS and IP

GROUP – B
(Short Answer Type Questions)
Answer any ***three*** from the following

$3 \times 5 = 15$

			Marks	CO No.
2.	a.	Explain PSW.	1	CO2
	b.	Write an assembly language program to reset all bits of Flag Register of 8085 μp.	4	CO2
3.		Explain the structure of flag register of 8085 with proper diagram and example.	5	CO1
4.	a.	What are RIM & SIM?	1	CO1
	b.	Explain the function of RIM & SIM.	4	CO1
5.	a.	What is the operating frequency of 8085 μp?	1	CO1
	b.	Write down the differences between hardware and software interrupt with example	4	CO3
6.		Write short notes on MIN/MAX operation of 8086 microprocessor.	5	CO1

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

			Marks	CO No.
7.	a.	What do you mean by instruction cycle, machine cycle and T-states?	3	CO3
	b.	Draw the timing diagram of the following instruction: **8005: STA 9250**	8	CO3
	c.	 Find out the address range for this RAM chip.	4	CO3

8. a.

Memory Address in Hex	Mnemonics in HEX
C000	LXI SP, FFFF
C003	LXI B, 1234
C006	MVI A, 05
C008	CALL A010
C00B	MOV B, C
C00C	HLT
A010	PUSH B
A011	POP PSW
A012	MVI C,56
A014	RET

Consider the above program and answer the following five question:

		What is the value of **PC** after completion of execution of CALL instruction?	2	CO2
		What will be content of **SP** after the execution of the program?	2	CO2
		What will be content of **A-F pair** after the execution of the program?	2	CO2
		Specify the stack locations where the contents of register pair B-C are stored.	2	CO2
		Assuming before CALL A010, the stack is not used, specify the contents of top two locations after completion of the execution of instruction POP PSW	2	CO2
	b.	Describe the sequence of events done in the execution of the following instruction: **9AFE: CALL 8B75**	5	CO2
9.	a.	Explain **LDAX, XRA, CMP** instruction with proper example	6	CO2
	b.	Write an assembly language program to find **maximum** of a series of numbers. The length is given in the location 912F and the series itself starts from 9130. Store the result at 9200.	5	CO2
	c.	Calculate the time delay incurred in the following delay routine: **LXI C, 34** **LOOP: DCR C** **JNZ LOOP** Assume the microprocessor has an operating frequency 2 MHz.	4	CO2
10.	a.	Describe the different addressing modes of 8086 µp.	4	CO1
	b.	What are the main function performed by BIU and EU operational unit of 8086 µp?	8	CO1
	c.	How pipelining achieved in 8086 microprocessor?	3	CO1
11.		Short note (Answer any three)	3x5=15	
	a.	Addressing modes of 8051 Microcontroller.	5	CO1
	b.	8086 Flag Register	5	CO1
	c.	Vectored vs Non-vectored Interrupts.	5	CO1
	d.	Demultiplexing of the bus AD_7-AD_0 in 8085 Microprocessor	5	CO1
	e.	Addressing modes of 8085	5	CO3