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**END SEMESTER REGULAR / RETEST
EXAMINATION, JULY – 2023**

Semester : 4th

Subject Code : CO – 403

MICROPROCESSOR AND INTERFACING

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Instructions :

- (i) All questions of PART – A are compulsory.
- (ii) Answer any *five* questions from PART – B.

PART – A

Marks – 25

- 1 Fill up the blanks : 1×5=5
 - (a) The data bus of intel 8086 microprocessor is _____ bit.
 - (b) The full form of DS is _____.
 - (c) MOV BX, 00F2H is a _____ addressing mode.

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- (d) IC 8237 is a _____ controller.
- (e) The DB directive in Assembly Language Programming defines _____ type variable.
2. Write True or False : $1 \times 5 = 5$
- (a) The Z(Zero) flag is set when the number is negative after any operation in the ALU.
- (b) 8086 Microprocessor can address up to 1 MB of memory.
- (c) LDS is used to load CS register from the memory.
- (d) The 8086 processor has 256 types of software interrupts.
- (e) In memory mapped I/O, the I/O devices and memory shares the same address space.
3. Answer the following questions : $1 \times 5 = 5$
- (a) Name the first Microprocessor. 4004
- (b) What are the registers used for forming BX registers ? SI, DI, BP, SP
- (c) Give one example of register addressing mode. MOV AX, BX

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- (d) How many ports are available in PPI 8255 ?
- (e) What is the meaning of MODAL directive in Assembly Language Programming ?
4. Choose the most appropriate answers : $1 \times 10 = 10$
- (a) Intel 8086 Microprocessor supports _____ modes of operation.
- (i) 2 (ii) 3
(iii) 4 (iv) 5
- (b) The size of each segment in 8086 microprocessor is
- (i) 64KB (ii) 24KB
(iii) 128KB (iv) 200KB
- (c) The SP indicates
- (i) Source pointer
(ii) Stack pointer
(iii) Signal pointer
(iv) None of the above

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(d) The instruction that supports additions when carry exists is

- (i) ADD
- (ii) ADC
- (iii) ADD & ADC
- (iv) None of these

(e) The instruction MOV AX, [2500H] is an example of

- (i) Immediate Addressing Mode
- (ii) Direct Addressing Mode
- (iii) Indirect Addressing Mode
- (iv) Register Addressing Mode

(f) Which of the following is not an arithmetic instruction ?

- (i) INC
- (ii) CMP
- (iii) DEC
- (iv) ROL

(g) In 7-segment display, how many LEDs are used ?

- (i) 8
- (ii) 9
- (iii) 10
- (iv) 7

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(h) The internal schematic of a typical stepper motor has

- (i) 1 winding
- (ii) 2 windings
- (iii) 3 windings
- (iv) 4 windings

(i) The directive used to inform the assembler, the names of the logical segments to be assumed for different segments used in the program is

- (i) ASSUME
- (ii) SEGMENT
- (iii) SHORT
- (iv) DB

(j) The directive that marks the end of an assembly language program is

- (i) ENDS
- (ii) END
- (iii) ENDS and END
- (iv) None of the mentioned above.

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PART - B
Marks - 45

5. (a) Explain briefly about Segment Registers of 8086 Microprocessor. 6
- (b) Write briefly about Flag Register of 8086 Microprocessor. 3
6. (a) Write down the purposes of the following PIN of 8086 Microprocessor: $\frac{1}{2} \times 6 = 3$
- (i) ALE (ii) NMI
(iii) INTR (iv) HLDA
(v) DEN (vi) BHE
- (b) Differentiate between Minimum mode and Maximum mode of 8086 microprocessor. 4
- (c) Write any four features of Intel 80386 microprocessor. 2
7. (a) Write briefly about any three of the following addressing modes of 8086 microprocessor: $2 \times 3 = 6$
- (i) Immediate addressing mode
(ii) Direct addressing mode

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- (iii) Indexed Addressing Mode
(iv) Based index Addressing Mode.
- (b) Explain the following instructions of 8086 microprocessor: $\frac{1}{2} \times 6 = 3$
- (i) ROR (ii) AND
(iii) INC (iv) MOVS
(v) JMP (vi) SUB.
8. (a) Write briefly about the following: $2 \times 2 = 4$
- (i) I/O mapped I/O
(ii) Memory mapped I/O.
- (b) Explain briefly about hardware and software interrupts of 8086 microprocessor. 5
9. (a) Distinguish between synchronous and asynchronous data transmission. 5
- (b) Draw timing diagram of Memory read Or Memory write Machine cycles for minimum mode of 8086 Microprocessor. 4

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10. Write briefly about any *two* : $4.5 \times 2 = 9$

(a) PPI (IC 8255)

(b) USART(IC 8251)

(c) DMA Controller(IC 8257).

11. (a) Write an assembly language program to subtract two 8-bit numbers. 4

(b) Write briefly about few assembler directives and its uses. 5

12. Write short notes on any *two* : $4.5 \times 2 = 9$

(a) Application of microprocessor

(b) Instruction cycle and Bus Cycle of 8086

(c) 7 segment Display

(d) Stepper motor.