

Total No. of printed pages = 3

**ECE 181501**

Roll No. of candidate

30/12/22

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**2022**

**B.Tech. 5<sup>th</sup> Semester End-Term Examination**

**EEE, ECE, ETE, PEIE**

**MICROPROCESSOR AND EMBEDDED SYSTEM**

**(New Regulation/New Syllabus)**

Full Marks – 70

Time – Three hours

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

Question no. 1 is compulsory and answer any *four* question no.2 to 7

1. Answer the following questions : (10 × 1 = 10)
- (i) The address bus width of a microprocessor which is capable 64k bytes of the memory is
    - (a) 8
    - (b) 12
    - (c) 16
    - (d) 20
  - (ii) The address bus of any microprocessor is always bidirectional
    - (a) True
    - (b) False
  - (iii) In 8085 microprocessor based system maximum possible number of input/output devices can be connected using I/O mapped I/O technique
    - (a) 64
    - (b) 256
    - (c) 512
    - (d) 65536
  - (iv) An opcode is
    - (a) Operand address
    - (b) Data on which operation is performed
    - (c) Operation to be performed
    - (d) None of these

**[Turn over**

- (v) Consider the following registers
- (1) Accumulator and flag register
  - (2) B and C register
  - (3) D and E register
  - (4) H and L register

Which of these 8-bit registers of 8085 microprocessor can be paired together to make a 16-bit register?

- |               |               |
|---------------|---------------|
| (a) 1,3 and 4 | (b) 2,3 and 4 |
| (c) 1,2 and 3 | (d) 1,2 and 4 |

(vi) ALE stands for

- |                          |                             |
|--------------------------|-----------------------------|
| (a) Address Logic Enable | (b) Arithmetic Latch Enable |
| (c) Address Latch Enable | (d) Arithmetic Logic Enable |

(vii) When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?

- |          |        |
|----------|--------|
| (a) PSW  | (b) SP |
| (c) DPTR | (d) PC |

(viii) How are the status of the carry, auxiliary carry and parity flag affected if the write instruction MOV A, #9C ADD A, #64H

- |                     |                     |
|---------------------|---------------------|
| (a) CY=0, AC=0, P=0 | (b) CY=1, AC=1, P=0 |
| (c) CY=0, AC=1, P=0 | (d) CY=1, AC=1, P=1 |

(ix) JZ, JNZ, instructions checked content of \_\_\_\_\_ register.

- |          |         |
|----------|---------|
| (a) DPTR | (b) B   |
| (c) A    | (d) PSW |

(x) To initialize any port as an output port what value is to be given to it?

- |                   |   |
|-------------------|---|
| (a) $0 \times FF$ | (b) $0 \times 00$                       |
| (c) $0 \times 01$ | (d) A port is by default an output port |

2. (a) Explain Hardware Model and Programming Model of 8085 Microprocessor with neat diagrams. (4 + 4 = 8)

(b) Draw the 8085 Flag register. Explain the operation of each flag in the register. (2 + 5 = 7)

3. (a) Classify 8085 instructions on the basis of its different functions. (5)

(b) Data byte 32H is stored in register B and data byte 88H is stored in the accumulator. Show the contents of registers B, C and accumulator after execution of the following two instructions:

MOV A, B

MOV C, A

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(c) Write an assembly language program to transfer a block of 10 data stored in location starting from 8050 to another location starting from 9050. (7)

4. (a) If the memory chip size is  $2048 \times 8$  bits, how many chips are required to make up 16Kbyte memory? (3)
- (b) List the sequence of events that occur when 8085 executes CALL instruction with an example. (5)
- (c) Draw the timing diagram of the instruction MVI A, 32H. (7)
5. (a) Define the following terms (3 × 1 = 3)
- (i) Instruction Cycle
- (ii) Machine Cycle
- (iii) T State
- (b) Explain the multiple interrupts and priorities of 8085 microprocessor. Draw the interrupt structure of 8085. (5)
- (c) What are the control signals necessary in the memory mapped I/O? (2)
- (d) 4 switches are connected with 8085 through 8255 write an assembly language program that will read the status of these switches and will display it in a series of LED connected with display with 8255. (5)
6. (a) What are the addressing modes supported by 8051? (5)
- (b) Differentiate the given 8051 instructions: MOVC and MOVX. (2)
- (c) Write an assembly language program to perform multiplication of two 8-bit numbers using 8051 instruction set. (8)
7. Write short notes on any *three* of the following topics. (3 × 5 = 15)
- (a) Direct Memory Access
- (b) 8255 PPI
- (c) Cache Memory
- (d) RISC and CISC processor
- (e) ARM Microcontroller.

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