

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID-SEMESTER EXAMINATION MO/2024)**

**CLASS: B.TECH
BRANCH: ECE**

**SEMESTER: V/ADD
SESSION: MO/2024**

SUBJECT: EC303 MICROPROCESSOR & MICROCONTROLLER

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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|--------|---|-----|-------------|-----------|
| Q.1(a) | What is meant by hardware control matrix? Mention a suitable alternative for that and explain it with a block diagram. | [2] | CO1 | BL
L2 |
| Q.1(b) | Write down the pins of 8085 μ p with their brief description to perform the following.
i) to synchronise with the slower peripherals,
ii) pins used in DMA transfer,
iii) to provide the clock to the processor
iv) Pins reflecting the status of the processor
v) to reset the processor and the peripherals connected to the processor | [3] | CO2 | L4 |
| Q.2(a) | Differentiate the following with an example:
i) Machine cycle and Instruction cycle of 8085 μ p
ii) Temporary (TMP) register and WZ registers | [2] | CO2 | L4 |
| Q.2(b) | Write an 8085 μ p-based assembly language program to select only BCD numbers from a group of 32 bytes residing in locations starting from 2400H and store them in locations starting from 2500H. After that, arrange them in ascending order in the same location. | [3] | CO2 | L1,
L2 |
| Q.3(a) | Explain the following Instructions for 8085 μ p with suitable examples.
i) DAA, ii) DAD R _p , iii) XTHL iv) POP PSW | [2] | CO1 | L1 |
| Q.3(b) | The 8085-based system is interfaced with memories of 8K x8 ROM and 4K x 8 RAM1. Expanded the existing memory by another 4K x 8 RAM2. Show the design and write the memory map for the ROM, RAM1, and RAM2. | [3] | CO3 | L2,
L4 |
| Q.4(a) | An ultrasonic sensor is connected to the SOD pin of 8085 μ p. Write an 8085-based assembly language program to switch it 'ON' and 'OFF' at an interval of two milliseconds if the processor is operating at a 5 MHz clock. Assume the delay is available at location 2700H. | [2] | CO2,
CO3 | L4 |
| Q.4(b) | What are the three purposes for which SIM and RIM instructions are used? Also, show their bit patterns. | [3] | CO1 | L2,
L3 |
| Q.5(a) | Why is an EI instruction always written before the RET command of an Interrupt Service Routine (ISR)? Write down the different ways of disabling an interrupt arriving at INTR pin. | [2] | CO1 | L2,
L3 |
| Q.5(b) | Write an 8085-based assembly language program to design a real-time clock to count up to one minute if 100 interrupt requests per second arrive at RST 5.5 pin of 8085 μ p. Display "MINUTES" and "SECONDS" from ports 01 and 02, respectively. Disable the interrupt once the minute count is over. | [3] | CO2,
CO3 | L5 |