

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: ECE**

**SEMESTER : V/ADD
SESSION : MO/2025**

SUBJECT: EC303 MICROPROCESSORS & MICROCONTROLLERS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

- | | | CO | BL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|---------------|-----------------|--------------|-------------|------|-----------------|--------------|--|---------|---------------|----------|---|---|---------|--|--|--|---|---------|--|--|--|---|------|--|--|--|---|-----|--|--|--|---|----|--|--|--|
| Q.1(a) What are the two functions of TMP register connected to ALU section in 8085?
What are the uses of WZ temporary registers? Explain by giving suitable examples. | [5] | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.1(b) Fill the following table | [5] | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Sl No.</th> <th style="width: 30%;">Instruction</th> <th style="width: 20%;">Type</th> <th style="width: 20%;">Addressing Mode</th> <th style="width: 10%;">No. of Bytes</th> </tr> </thead> <tbody> <tr> <td></td> <td>MOV A,B</td> <td>Data Transfer</td> <td>Register</td> <td>1</td> </tr> <tr> <td>1</td> <td>MOV A,M</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>OUT 40H</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>XTHL</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>RET</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>DI</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | Sl No. | Instruction | Type | Addressing Mode | No. of Bytes | | MOV A,B | Data Transfer | Register | 1 | 1 | MOV A,M | | | | 2 | OUT 40H | | | | 3 | XTHL | | | | 4 | RET | | | | 5 | DI | | | |
| Sl No. | Instruction | Type | Addressing Mode | No. of Bytes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MOV A,B | Data Transfer | Register | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | MOV A,M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | OUT 40H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | XTHL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | RET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | DI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.2(a) Write down the SIM and RIM Control words and explain the following
i. Steps for outputting data serially
ii. Steps for inputting data serially
iii. Steps setting the mask of the interrupts
iv. Steps for checking the pending of the interrupts
Steps for enabling or disabling the interrupts | [5] | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.2(b) Two bytes X and Y are stored in memory locations 2400H and 2500H respectively. Write 8085 based program which uses RST 5.5 interrupt to compare the bytes and a. if X is greater than Y , stores FFH at 2600H and returns to main program.
b. if X is less than Y , stores 00 at 2600H and returns to main program.
c. if X is equal to Y then returns to the main program by disabling the interrupt. | [5] | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.3(a) What do you understand by pipelined architecture? How is it implemented in 8086? How do Request / Grant pins function in maximum mode of 8086 μ p? Which signals in minimum mode do they replace? | [5] | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.3(b) Explain the concept of segmented memory? What are its advantages? Explain the physical address generation in 8086 by giving suitable example. | [5] | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.4(a) An 8-bit D/A converter is connected to port A of 8255 chip. Write an 8085 program to generate a voltage waveform in which the voltage rises linearly from -3V to +3 volts and decreases to -3V at the same rate. The cycle repeats itself. | [5] | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.4(b) Interface an 8253 PIT with 8085 with control register address 43H. What will be the status of A8 – A15 pins during the execution of IN and OUT instructions? | [5] | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.5(a) Explain the Internal RAM structure of 8051 microcontroller. Differentiate between byte address and bit address. How does 8051 differentiate between internal RAM/ROM and External RAM/ROM? | [5] | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.5(b) Write 8051 based program to perform the following.
i. Keep monitoring P1.2 until it becomes high.
ii. When P1.2 becomes high write value 45H on P0.
iii. Send a high to low pulse to P2.3
Byte addresses of Port1 and Port2 are given as 90H and A0H respectively | [5] | 5 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |