



**MAULANA ABUL KALAM AZAD UNIVERSITY OF
TECHNOLOGY, WEST BENGAL**

Paper Code : EC-502

PUID : 05051 (To be mentioned in the main answer script)

MICROPROCESSORS & MICROCONTROLLERS

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)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) 8253 has how many modes of operation ?
- | | |
|------|-------|
| a) 6 | b) 5 |
| c) 4 | d) 3. |
- ii) In 8051 microcontroller, which of the following is dedicated port ?
- | | |
|-----------|------------|
| a) Port 0 | b) Port 1 |
| c) Port 2 | d) Port 3. |
- iii) The segment and offset address of the instruction to be executed by 8086 microprocessor are pointed by
- | | |
|--------------|---------------|
| a) CS and SI | b) DS and IP |
| c) CS and SP | d) CS and IP. |

- xi) Whenever the PUSH instruction is executed the stack pointer is
- a) Decremented by 1 b) Decremented by 2
c) Incremented by 1 d) Incremented by 2.
- xii) The physical address when CS = 2345 H and IP = 1000 H is
- a) 24450 H b) 23450 H
c) 12345 H d) 2345 H.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Describe different addressing modes of 8085.
3. Differentiate between Microprocessor and Microcontroller.
4. Write a program to calculate the sum of series of numbers. The length of the series is in memory location 8000 H and series itself starts from memory location 8001 H. The result of sum is stored in memory location 8500 H and carry is stored in memory location 8501 H.
5. What is interrupt ? Explain briefly about vectored and non-vectored interrupts of 8085. $2 + 3$
6. Design a microprocessor system for the 8085 microprocessor such that it should contain 16 kB of EPROM & 4 kB of RAM using two 8 kB of EPROMs and two 2 kB of RAMs.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Draw timing diagram of instruction "9000 H STA 9500 H". Assume accumulator content is 32 H.
b) Write a main program and a conversion subroutine to convert the binary number stored at 6000 H into its equivalent BCD number. Store the result from memory location 6100 H.

- c) Draw the diagram of interfacing of input and output device with the help of I/O mapped I/O technique. Assume that address of input port is 80 H and address of output port is 81 H. 5 + 5 + 5
8. a) Explain the format of flag register of 8086.
b) What are the advantages of having memory segmentation ?
c) How does 8086 support pipelining ?
d) What is purpose of queue in 8086 ? 4 + 5 + 3 + 3
9. a) What is the advantage of using 8253/8254 over delay subroutine ?
b) Explain the control word format for timer 8253/8254.
c) What are the different operating modes of 8253/8254 ? Explain briefly any two of operating modes with the help of timing diagram.
3 + 3 + (3 + 6)
10. a) Draw the block diagram of 8051 microcontroller.
b) Discuss the memory organization of 8051 microcontroller.
c) Discuss the different addressing modes of 8051 microcontroller. 5 + 5 + 5
11. Write short notes on any *three* of the following : 3 × 5
- a) BSR operation of 8255
b) MIN mode & MAX mode
c) Generation of control signal using decoder IC
d) Demultiplexing of Address and Data bus using Latch IC.
e) PIC Microcontroller.
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