# MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

**Paper Code : EC-502**

## MICROPROCESSOR AND MICROCONTROLLER

*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 : $10 \times 1 = 10$

   i) The instruction register holds

   a) flag condition b) op-code

   c) instruction address d) hex code.

   ii) The interfacing device used with an output port is

   a) buffer b) priority encoder

   c) latch d) none of these.







CS/B.TECH/ECE/ODD SEM/SEM-5/EC-502/2016-17

iii) Machine cycle in "CALL" instruction of 8085 CPU are

a) 6 b) 5

c) 4 d) 3.

iv) The vector address corresponding to software interrupt command RST7 in 8085 microprocessor is

a) 0017H b) 0027H

c) 0038H d) 0700H.

v) STA 9000H is a/an

a) data transfer instruction

b) logical instruction

c) I/O and machine control instruction

d) none of these.

vi) The addressing node used in the instruction STAX B is

a) direct b) resister

c) immediate d) register indirect.

vii) When subroutine is called the address of the instruction next to "CALL"s save in

a) stack pointer register b) program counter

c) stack d) PSW.

viii) For 8255 PPI, bi-directional mode of operation is supported in

a) Mode 1 b) Mode 2

c) Mode 3 d) Either (a) or (b).

ix) 8253 has

a) 6 modes of operation

b) 5 modes of operation

c) 4 modes of operation

d) 3 modes of operation.

x) Which is the BSR control word to set PC4 ?

a) 09H b) 07H

c) 04H d) 05H.

xi) The segment and off-set 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.









xii) In 8051 microcontroller, which of the following is the dedicated port ?

a) Port 0 b) Port 1

c) Port 2 d) Port 3.

## GROUP - B

### ( Short Answer Type Questions )

Answer any *three* of the following. 3 × 5 = 15

2. Write a program to reset all the Flags in 8085 microprocessor. Give the explanation.

3. Draw the timing diagram of MVI A, 08H.

4. Describe the different addressing modes of 8085.

5. What is meant by I/O mapped I/O and memory mapped I/O technique. Describe their advantages and disadvantages, if any.

6. a) What do you mean by logical segmentation of memory in 8086 and why it is needed ?

   b) What is meant by pipelining ? What are the advantages and disadvantages of it ? 2 + 3

## GROUP – C

### ( Long Answer Type Questions )

Answer any *three* of the following. 3 × 15 = 45

7. a) Write an ALP to find the sum of a series of 8 bit numbers, sum may be of 16 bits.

   b) Explain the sequence of events that takes place when the PUSH & POP instructions are executed. Illustrate the operation of stack instructions with suitable examples.

   c) Explain memory mapped I/O addressing and I/O mapped I/O addressing in 8085 microprocessor.

   5 + 5 + 5

8. a) How many ports are there in 8255 and what are they ?

   b) Discuss the different bits of the control word of 8255.

   c) Write down the MODE-0 control word for the following :

      i) Port A = input

      ii) Port B not used

      iii) Port C upper = Input, Port C lower = output.

   d) Discuss BSR operation of 8255. 2 + 5 + 3 + 5









9. a) Explain how 20-bit physical address is generated in 8086 microprocessor.

   b) What is the purpose of queue ? How many words does the queue store in the 8086 microprocessor ?

   c) How does 8086 support pipelining ? Explain.

   d) What are the advantages of having memory segmentation ? 3 + 4 + 3 + 5

10. a) Discuss the memory organization of 8051 microcontroller.

    b) What are the different interrupts available in 8051 microcontroller ?

    c) Discuss the different addressing modes of 8051 microcontroller. 5 + 5 + 5

11. Write notes on any *three* of the following : 3 × 5

a) Addressing modes of 8051 microcontroller

b) MAX mode and MIN mode

c) Memory organization of 8051 microcontroller

d) PIC microcontroller.