Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech (CSE/IT/PWE/EEE)/SEM-5/EI-502/2010-11

2010-11

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) What is the vector location of NMI ?

a) 00000H b) 00008H

c) 00010H d) 00014H.

ii) The interrupt pin available in the 8085A microprocessor chip is

a) ALE b) HLDA

c) INTER d) SOD.

iii) For 8257 controller ..... is the highest priority channel by default.

a) CH-3 b) CH-0

c) CH-1 d) any channel.

iv) The clock frequency is 60 Hz. The clock interrupt handler on a computer needs 2 msec per clock tick. What percentage of the CPU is devoted to the clock ?

a) 1·2 b) 7·5

c) 12 d) 18·5.

v) What is the BSR control word to set PC_4?

a) 09 b) 07

c) 04 d) 05.

vi) The total memory space available in 8086 is

a) 16 kB b) 64 kB

c) 1 MB d) 256 kB.

vii) An 8-bit A/D converter has a resolution of

a) $1/2^4$ b) $1/2^8$

c) $1/2^2$ d) $1/2^{16}$.

viii) Select the invalid instruction :

a) MOV M, A b) ADI 67

c) LDAX B d) STAX H.

ix) The maximum operating frequency of 8254 is

a) 2 MHz b) 3 MHz

c) 6 MHz d) 8 MHz.

x) The number of multiplexed bus in case of 8086 is

a) 16 b) 8

c) 20 d) 4.

xi) 8086 exchanges data word with odd memory bank when

a) $\overline{BHE} = 0$ and $A_0 = 0$ b) $\overline{BHE} = 0$ and $A_0 = 1$

c) $\overline{BHE} = 1$ and $A_0 = 0$ d) $\overline{BHE} = 1$ and $A_0 = 1$.

xii) If ready pin is grounded, it will introduce ..... states into the bus cycle of 8086/8088 μP.

a) wait b) idle

c) wait and remain idle d) all of these.

GROUP – B

(Short Answer Type Questions)

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

2. Write down the steps of execution of an instruction sequentially by 8085 microprocessor.

3. Write an A.L.P. in 8085 to find the total number of zeros and ones in a given string. Store the results in the memory location 9055 H onwards.

4. i) Explain why no. of output ports in I/O mapped I/O technique is restricted to 256 ports.

   ii) Specify the 8085 signals that are used to enable an input and output port.

   iii) If an output port can have the same 8 bit address, how does the 8085 differentiate between ports ? 2 + 1 + 2

5. Draw the timing diagram of MOV A, M.

6. State the difference between architectures of 8086 and 8088 μP.

GROUP – C

(Long Answer Type Questions)

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

7. a) What do you mean by DMA operation ? Write down the steps of DMA operation. What is fixed priority mode and what is rotating priority mode ? 2 + 3 + 3

   b) If the clock frequency is 5 MHz, how much time is required to execute the instruction MVI B, 08 (7T state) ? Draw the timing diagram. 3 + 4

8. a) What is two key lockout and *N*-key rollover mode of 8279 ? How an A/D converter can be interfaced with a 8085 microprocessor ? 3 + 5

   b) Write an assembly language program for BCD to binary conversion. 4

   c) What are the functions of RESET, HOLD, INTERRUPT and READY pins ? 3

9. a) Describe the different addressing modes of 8086 microprocessor. 5

   b) Draw the architecture of 8086. What are the functions performed by BIU and EU of 8086 microprocessor. 7

   c) How is pipelining achieved in 8086 microprocessor ? 3

10. a) What do you mean by interrupt driven system ? Arrange the interrupt according to their priority. Define maskable and non-maskable interrupts. What is interrupt call location ? 2 + 2 + 2 + 1

    b) Why is decoder circuit needed ? Using 74LS 138 draw and explain the interfacing of memory and IO devices. 1 + 7

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

    a) Addressing modes of 8051 microcontroller

    b) 8259 Interrupt controller

    c) BSR mode of 8255

    d) MIN/MAX mode operation of 8086 microprocessor

    e) Hardware interrupt of 8085 CPU.