Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH (ECE)/SEM-5/EI (EC)-502/2011-12

2011

MICROPROCESSOR & 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 × 1 = 10

i) The instruction XCHG exchanges the contents of

a) ACC and HL pair

b) BC pair and HL pair

c) DE pair and HL pair

d) HL pair and memory location.

ii) Machine cycles for 1 N instruction are

a) 6 b) 5

c) 4 d) 3

iii) RST 7·5 interrupt is

a) Vectored and Maskable

b) Non-vectored and Maskable

c) Non-vectored and Non-maskable

d) Vectored and Non-maskable.

iv) When a subroutine is called the address of the instruction next to CALL is saved in

a) Stack pointer

b) Program Counter

c) Stack

d) Combination of flag and AX register.

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

a) 09 H b) 07 H

c) 04 H d) 05 H.

vi) An 8 K ∞ 8 ROM, holding the monitor program in a microprocessor trainer kit has the end address.

a) 8000 H b) 4000 H

c) 1 FFF H d) 3 FFF H.

vii) What will be the content of the accumulator and the status of CY flag after RLC operation, if the content of the accumulator is BCH and CY is 0 ?

a) 79 H, 1 b) 78 H, 1

c) 5E H, 0 d) 5D H, 0

viii) How many address lines are there in 8086 microprocessor ?

a) 16 b) 8

c) 20 d) 12.

ix) The total I/O space available in 8085 if used peripheral mapped I/O.

a) 64 b) 128

c) 256 d) 512.

x) 8251 is a

a) USART IC b) Counter

c) interrupt controller d) none of these.

xi) If the crystal with 8085 is 2 MHZ, the time required to execute an instruction of 20 T states is

a) 20 μS b) 10 μS

c) 40 μS d) 5 μS.

xii) A single instruction to clear the lower four bits of the accumulator in 8085 microprocessor is

a) XRI OF H b) ANI FO H

c) ANI OF H d) XRI FO H.

GROUP – B

(Short Answer Type Questions)

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

2. Describe the addressing modes of 8085.

3. a) What are the functions of ALE, HOLD and READY signals ? 3

b) Differentiate between I/O mapped I/O and memory mapped I/O. 2

4. Calculate the total time delay for the following loop in 8085 microprocessor, assuming the clock period is 0·5 microsecond.

	L ∞ I B, 238 HH	; 10 T
LOOP :	DC ∞ B	; 6 T
	MOV A,C	; 4 T
	ORA B	; 4 T
	JNZ LOOP	; 10/7 T

5. a) Give the bit configuration of 8085 flag register. 2
   b) Write down the mode-0 control word of 8255 A for the following :
   PORT *A* = input, PORT *B* not used,
   PORT *C* (upper) = input, PORT *C* (lower) = output. 3
6. Draw the timing diagram of Memory Read machine cycle of 8085 microprocessor.

GROUP – C

(Long Answer Type Questions)

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

7. a) What are vectored and non-vectored interrupts ? Explain the instructions RIM and SIM. Write an instruction to enable the RST 7·5, RST 6·5 and disable RST 5·5. 5
   b) Discuss how 8253 is used to generate square waves. 5
   c) What is the difference between CALL and JMP instructions of 8085 microprocessor ? 5
8. a) Describe the different addressing modes of 8086 microprocessor. 6
   b) What are the main functions performed by BIU and EU unit of 8086 microprocessor ? 5
   c) How is pipeline achieved in 8086 microprocessor ? 4
9. a) Discuss the memory organization of 8051 microcontroller. 5
   b) What are the different interrupts available in 8051 microcontroller ? 5
   c) Discuss the different addressing modes of 8051 microcontroller. 5
10. Discuss the hardware and software of any microprocessor based industrial application.
11. Write notes on any *three* of the following : 3 ∞ 5
    a) Synchronous mode of data transfer
    b) Serial mode of operation using 8085 microprocessor
    c) Interfacing memory with a microprocessor
    d) Designing I/O ports
    e) Interrupt service Subroutine.