Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech (EE) (N)/SEM-5/EE-504C/2012-13

2012
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 : $10 \times 1 = 10$

i) PSW is a

a) 16 bit register b) 32 bit register

c) 8 bit register d) 6 bit register.

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

a) XRI 0FH b) ANI FOH

c) ANI OFH d) XRI F0H.

iii) Number of machine cycles in "CALL" instruction is

a) 6 b) 5

c) 4 d) 3.

iv) Address lines required for a 32 k-byte memory chip are

a) 13 b) 14

c) 15 d) 16.

v) The call location for the interrupt RST 5.5 is

a) 0034H b) 002CH

c) 0038H d) 0030H.

vi) 8259 is

a) Programmable DMA controller

b) Programmable interval timer

c) Programmable interrupt controller

d) none of these.

vii) The number of register pairs of 8085 Microprocessor is

a) 3 b) 2

c) 4 d) 5.

viii) The chip select signal for even memory bank of 8086 Microprocessor is

a) AO b) BHE

c) ALE d) None of these.

ix) The total addressable space supported by 8086 is

a) 16 kB b) 64 kB

c) 1 MB d) None of these.

x) For 8255 PPI. the bidirectional mode is supported in

a) Mode 0 b) Mode 1

c) Mode 2 d) none of these.

xi) The number of RAM bytes in 8081 microcontroller is

a) 256 b) 512

c) 128 d) 2 k.

xii) How many flag registers are there in 8051 ?

a) 9 b) 8

c) 6 d) 5.

GROUP – B

(Short Answer Type Questions)

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

2. Describe the format of PSW. What is SFR ? Where is it located ? 4 + 1
3. a) Draw the basic block diagram of a Microcontroller.
   b) Write the salient features of 8051 Microcontroller. 3 + 2
4. How many flag bits are there in 8085 microprocessor ? Explain any two of them. 1 + 2 + 2
5. Write a program to generate a square ware pulse of 50% duty cycle by using SIM instruction of 8085.
6. Write the BSR mode control word routine for 8255 to set PC7 & PC3 & to reset them after 10 ms. The port address of the control register is 83 H.

GROUP – C

(Long Answer Type Questions)

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

7. a) What are the maskable and non-maskable interrupts in 8085 ?
   b) What are the vectored and non-vectored interrupts in 8085 ?
   c) Write the accumulator bit pattern for SIM and RIM instructions.
   d) Set the interrupt mask so that RST 5.5 is enabled, RST 6.5 is masked and RST 7.5 is enabled.
   e) Write an assembly language program to check if RST 5.5 is pending. If it is pending, enable RST 5.5 without affecting any other interrupt. 1 + 1 + 3 + 5 + 5

8. a) What are the main functions performed by BIU & EU unit of 8086 microprocessor ?

   b) How is pipelining achieved in 8086 microprocessor ?

   c) Explain the concept of segmented memory. What are its advantages ?

   d) How does the 8086 differentiate between an opcode and data ? (3 + 3) + 3 + 3 + 3

9. a) Explain the different modes of operation of 8255.

   b) Explain the control word format of the 8255 in I/O and BSR mode.

   c) Write the control word to set port A as input in mode 1 and load this control word into control word register. Briefly describe the process of data transfer from input device. 3 + (2 + 2) + (2 + 3 + 3)

10. a) With the help of block diagram explain the operation of 8051 microcontroller.

    b) Write an 8051 assembly language program to add two 16-bit nos.

    c) How many register banks are there in the RAM of 8051 microcontroller ? Explain their functions. 7 + 4 + 4

11. a) Explain the memory segmentation scheme with reference to 8086 μP.

    b) What is the role of Execution Unit of 8086 μP ? Explain the working of its each section.

    c) How the physical address is generated in 8086μP ? Explain with example.

    d) What are the differences between minimum mode and maximum mode operations of 8086 ? 5 + 5 + 2 + 3