Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech (ECE)/SEM-5/EI (EC)-502/2009-10

2009

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 stack and the stack pointer

      a) both reside in memory

      b) both reside in the CPU

      c) former resides in memory but the latter in the CPU

      d) former resides in CPU but the latter in the memory.

   ii) The number of I/O lines for the 8255 chip is

      a) 16 b) 32

      c) 8 d) none of these.

iii) In 8085 CPU, the Jump instruction address affects the

a) accumulator b) stack pointer

c) H-L pair d) program counter.

iv) The addressing mode used in the instruction STAX B is

a) direct b) resister

c) immediate d) register indirect.

v) In 8085 microprocessor, which of the following is non-maskable interrupt ?

a) RST 7·5 b) TRAP

c) Hold d) INTR.

vi) Suppose before executing the following instructions all flags of 8085 are zero. Which flag will be the set after executing all the following instructions ?

MVI B, FF_H

MVI C, FF_H

INX B

a) S b) Z

c) CY d) none of these.

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

a) stack b) program counter

c) stack pointer register d) none of these.

viii) The call location for the interrupt RST5 is

a) 0034H b) 002CH

c) 0038H d) 0030H.

ix) The total no. of addressing modes for 8086 microprocessor is

a) 4 b) 12

c) 2 d) 5

x) RST 7·5 interrupt is

a) vectored & maskable

b) vectored & non-maskable

c) direct & maskable

d) direct & non-maskable.

xi) 8259 is

a) programmable DMA controller

b) programmable interval timer

c) programmable interrupt controller

d) none of these.

xii) 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.

xiii) The instruction PCHL

a) stores the contents of HL pair to a specified memory location

b) copies the contents of HL pair into the program counter

c) stores the contents of HL pair to accumulator

d) exchanges the contents of HL pair with program counter.

xiv) If clock frequency is 2 MHz then the time required for execution of instruction STA 1900H is

a) 6·5 millisec b) 13 microsec

c) 6·5 microsec d) 10 microsec.

xv) The chip select signal for even memory bank of 8086 microprocessor is

a) AO b) BHE

c) ALE d) both (b) & (c).

GROUP – B
(Short Answer Type Questions)

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

2. How does the ALE signal demultiplex the AD0-7 bus ? Explain with diagram.

3. What are the advantages of having segmentation ? How does the 8086 microprocessor support segmentation ?

4. Write an assembly language program that display the square of a number and its corresponding address from a LOOK-up table.

5. Briefly describe about different flags in 8086 microprocessor. State the difference between flags of 8086 microprocessor and 8085 microprocessor.

6. What do you mean by Mode 0, Mode 1 and Mode 2 operations of 8255 ?

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. 3 × 15 = 45

7. a) Describe the different addressing modes of 8086 microprocessor.

b) What are the main functions of BIU ad EU units of 8086 microprocessor ?

c) Describe pipeline hazards.

d) Write the 8086 assembly language statement which will perform the following operations :

i) Load the number 7986 H into the BP register

ii) Copy the BP register contents to SP register

iii) Copy the contents of AX register to the DS register

iv) Load the number F3H into the AL register.

3 + (2 + 2) + (4 × 2)

8. a) Can an input port and output port have the same address ? Justify.

   b) Write a subroutine to generate a delay of 40 ms between two successive counts, clock frequency is 2 MHz.

   c) Write the accumulator bit pattern for SIM and RIM instruction.

   d) Write the functions of the following pin of 8085 :

      i) ALE

      ii) HOLD

      iii) CLOCK OUT. 4 + 5 + 3 + 3

9. a) Draw the timing digram for IN instruction of Intel 8085 microprocessors.

   b) What is the significance of masking ? Write the code which will mask RST 6·5.

   c) Explain how the contents of the two register pairs can be exchanged using STACK in 8085.

   d) Write a program to find the greatest number from the given 10 numbers. 5 + (1 + 3) + 3 + 3

10. a) Describe the different addressing modes of 8086 microprocessors.

    b) What are the main functions of BIU and EU units of 8086 microprocessors.

    c) Write the assembly language statement which will perform the following operations :

        i) copy the BP register content to SP register

        ii) copy the contents of AX register to the DS register

        iii) load the number F2 H into AL register

        iv) load the number 1456H into BP register.

    3 + (2 + 2) + 8

11. a) What is the purpose of DMA controller ?

    b) Write an assembly level program using subroutine to convert a packed BCD number into equivalent binary number. Given the packed BCD number is stored in memory location 2500 and the equivalent binary number is to be stored at memory location 5200.

    c) Explain the function of RIM instruction.

    d) What do you mean by 16-bit microprocessor ?

    e) Compare the I/O mapped I/O and Memory mapped I/O.

    2 + 6 + 3 + 1 + 3