Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.Tech (ICE)/SEM-5/IC-503/2010-11
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)   In 8085 Microprocessor, which of the following is non-maskable interrupt ?

a)   RST 7·5   b)   TRAP

c)   Hold   d)   INTR.

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

MVI   B, FF_H
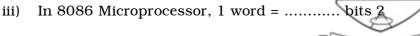
MVI   C, FF_H

INX   B

a)   S   b)   Z

c)   CY   d)   None of these.

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iii) In 8086 Microprocessor, 1 word = ... bits ?

    a)   4   b)   8

    c)   16   d)   None of these.

iv) In 8086 Microprocessor, $(CS) = 2347_H$, $(IP) = 8240_H$. What is the physical address ?

    a) $2B6B0_H$ b) $0A587_H$

    c) 08240_H d)   None of these.

v) To perform Handshake I/O using 8255 PPI, which mode should be chosen ?
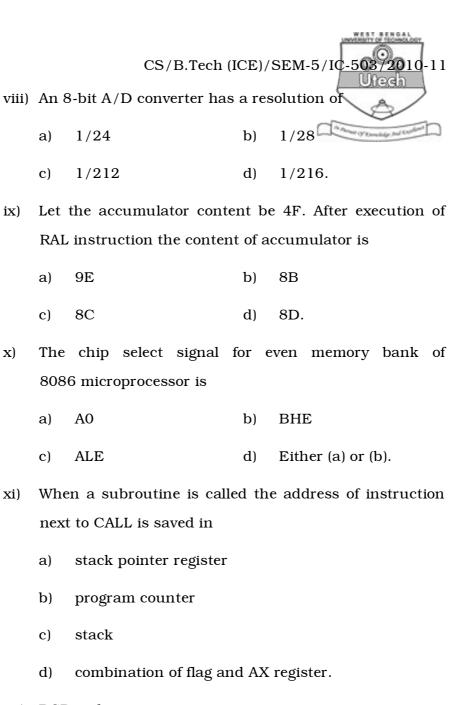
    a)   Mode 0   b)   Mode 1

    c)   Mode 2   d)   Any of (a) and (b).

vi) When the IN and OUT instructions are executed, the address of I/O device is placed in lower-order address bus $(A_0 - A_7)$. At this time the higher-order address bus $(A_8 - A_{15})$ content will be

    a) 00_H

    b)   Don't care

    c) FF_H

    d)   Same content as of $A_0 - A_7$.

vii) For OP code Fetch machine cycle the status signals of 8085 Microprocessor are

    a) $IO/\overline{M} = 0$, $S_1 = 0$, $S_0 = 1$

    b) $IO/\overline{M} = 0$, $S_1 = 1$, $S_0 = 0$.

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

a) 1/24   b) 1/28

c) 1/212   d) 1/216.

ix) Let the accumulator content be 4F. After execution of RAL instruction the content of accumulator is

a) 9E   b) 8B

c) 8C   d) 8D.

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

a) A0   b) BHE

c) ALE   d) Either (a) or (b).

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

a) stack pointer register

b) program counter

c) stack

d) combination of flag and AX register.

xii) BCD code is

a) weighted code   b) reflective code

c) self complement code d) error correction code.

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. Write an assembly language program based on 8085 CPU to multiply two unsigned 8-bit binary numbers. Assume that the multiplicand and the multiplier are available from two memory locations of user's memory.

4. Write down the operation of the following instructions :

    i)   XCHG

    ii) PCHL

    iii) XTHL

    iv) DAA

    v)   DAD.

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 and 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) Distinguish between S/W interrupts and H/W interrupts in Intel 8085 microprocessor.

    b) What are the functions of RESET, HOLD, INTERRUPT & READY pins ?

    c) Draw the timing diagram of IN instruction of Intel 8085 microprocessor.

    d) Write the accumulator bit pattern of RIM & SIM instruction.

    e) Explain the block diagram of 8259A PIC.

                                    2 + 4 + 4 + 2 + 3

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9. a) What is Rate Generator Mode of 8253 PIT ?

   b) Explain how the 8237 DMA controller transfers 64k bytes of data per channel with 8 address lines. What do you mean by DMA operation ?

   c) Write the BSR control word subroutine to set bits PC_5 & PC_7 & reset them after 10 ms. Assume that delay subroutine is available.

   d) In mode 1 operation of 8255 PPI, what are the control signals when ports A & B act as input ports ? Discuss the control signals.   2 + 3 + 2 + 3 + 5

10. a) Briefly describe the different flags in 8086 microprocessor. State the difference between flags of 8085 microprocessor & 8086 microprocessor.

    b) Write a program to add two Hex no 7A & 46 and to store the sum at memory location $XX98_H$ and flag status at $XX97_H$.

    c) What happens when a subroutine calls another subroutine in 8085 CPU ?   5 + 5 + 5

11. a) Write the initialization instruction for 8259 A Interrupt Controller to meet the following specifications :

     i) Interrupt vector address: 2090H

     ii) Call address interval of 8 bits.

     iii) Nested mode.

  b) A printer is connected through 8255 in the following configuration :

    Port A is connected with 8 data lines. PC_0 polls the busy line which is o/p from printer, PC_4 sends the strobe pulse which is i/p to the printer to latch the data in buffer.

    Write the software driver routine in assembly language for this implementation.

  c) Why is 8251 interfaced with 8085 microprocessor ?

  d) Suppose port A of 8255 A is set up in MODE 1 and the status word is read as 18H. Is there an error in the status word ?

  e) Write down the function of SYNDET/BD pin of 8251 USART.   4 + 4 + 2 + 2 + 3

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