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CS/B.Tech/ICE(O)/SEM-5/IC-503/2012-13

2012

MICROPROCESSOR AND MICRO-CONTROLLER

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) If the crystal connected with 8085 processor is of 2MHz, the time required to execute an instruction of 20 *T* states is

a) 20 microsecond b) 10 microsecond

c) 40 microsecond d) 5 microsecond.

ii) Which of the following instructions in 8085 microprocessor is used for 16 bit addition ?

a) DAD B b) ADC B

c) ADD B d) none of these.

iii) Which of the following registers in 8086 CPU is known as counter register ?

a) DX b) CX

c) AX d) BX.

iv) The size of the flag register available in intel 8085 microprocessor is

a) 7 bit b) 8 bit

c) 5 bit d) 6 bit.

v) Intel 8237 is the peripheral device which is identified as programmable as

a) Programmable DMA controller

b) Programmable interrupt controller

c) Programmable floppy disk controller

d) Programmable peripheral interface.

vi) The memory unit for an 8086 microprocessor is organized as a set of

a) 1 M address bit b) 5 M address bit

c) 10 M address bit d) none of these.

vii) Which of the following instructions in 8086 is used for immediate address mode ?

a) MOV AL, 35H b) MOV AX, CX

c) MOV AX, [BX] d) ADD AX, (BX + SI).

viii) How many basic instructions are used in 8085 microprocessor ?

a) 80 b) 85

c) 95 d) 100.

ix) What is the maximum frequency used for 8086 microprocessor ?

a) 5 MHz b) 10 MHz

c) 15 MHz d) 20 MHz.

x) Which of the following instructions is used for exchange stack top with HL pair ?

a) SPHL b) XTHL

c) PCHL d) none of these.

xi) If a DMA request is sent to the microprocessor with a high signal to the HOLD pin, the microprocessor acknowledges the request

a) after completing the present cycle

b) after completing the program

c) immediately after receiving the signal

d) none of these.

xii) When an 8085 system is reset

a) all the interrupts including the TRAP are disable

b) all the interrupts excluding the TRAP are disable

c) all the interrupts are disable

d) all the interrupts are enable.

GROUP – B
(Short Answer Type Questions)

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

2. Draw 8085 timing diagram of the Interrupt ACK machine cycle and execution of an RST instruction.

3. Write a program to count continuously in HEX from 00H to FFH in a system with frequency 4 MHz. Use register *B* to set up 10 m sec delay between each count and display the number in output port address FFH.

4. Specify the frequency provided by the crystal network of 8085 microprocessor. Indicate the functions of BIU in brief.

5. Differentiate between Memory Mapped I/O and I/O Mapped I/O.

6. Write down the steps of DMA operation.

GROUP – C
(Long Answer Type Questions)

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

7. 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 SIM & RIM instruction.

e) A set of 5 ASCII Hex digits is stored in the memory location starting from XX55H. Write a program to convert these numbers in binary. Add these numbers in binary and store the result in YY00H memory location.

f) Write a subroutine to subtract one packed BCD number from another BCD number. The minuend is placed in register *B* and the subtrahend is placed in register *C* by the calling program. Return the answer into the accumulator. 2 + 2 + 4 + 2 + 2 + 3

8. a) What is stack ?

b) "Stack is used only when a CALL instruction is executed in 8085." Comment.

c) What do you mean by Vectored & Non-vectored interrupts ? Write down their call location.

d) Draw the timing diagram of CALL instruction of Intel 8085 microprocessor.

e) Write the Accumulator bit pattern of RIM and SIM instructions.

f) Discuss the operation performed by PUSH and POP operation. 1 + 3 + 3 + 4 + 2 + 2

9. a) Explain the function of "BIU" & "EU" units of 8086 microprocessor.

   b) How is "pipelining" achieved in 8086 microprocessor ?

   c) Describe the different addressing modes of 8086 microprocessor.

   d) Briefly describe about different flags in 8086 microprocessor.

   e) Write down the architecture of 8086 microprocessor.

   3 + 3 + 3 + 3 + 3

10. a) Write a program to count continuously in HEX from 00H to FFH in a system with frequency 4 MHz. Use register *B* to set up 10 m sec delay between each count and display the number in output port address FFH.

    b) Specify two 8086 microprocessor signals that are used to latch data in an O/P port.

    c) How many bits ar stored by a 256 × 4 memory chip ? Can this chip be specified as 128 byte memory ?

    d) Can the I/P and O/P port addresses be same ?

    e) Write a subroutine for 1 second delay and explain the calculation when the clock speed of 8086 microprocessor is 2 MHz. 5 + 2 + 2 + 2 + 4

11. a) Why is 8251 interfaced with 8085 microprocessor ?

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

c) Why is 8255 called as a programmable peripheral interface ?

d) What do you mean by MODE 0, MODE 1, MODE 2 operations of 8255.

e) What is two-key lockout and N key rollover mode of 8279 ?

f) What are the major components of 8259A interrupt controller ? Explain their functions.

2 + 3 + 2 + 3 + 2 + 3