Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH/ECE(O)/SEM-5/EI(EC)-502/2012-13

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) The control signal used to distinguish between I/O operation and memory operation is
      a) ALE b) IO/$\overline{M}$
      c) SID d) SOD.

   ii) The control signal, HOLD is sent by 8085 in order to
      a) inform I/O device that the address is being sent over the AD line
      b) achieve separation of address from data
      c) synchronize with low speed peripheral
      d) to activate DMA.

   iii) The number of bytes of RAM contained in 8155 is
      a) 256 b) 512
      c) 1024 d) 2K.

iv) In 'JZ next' instruction of 8051 microcontroller in which register's content is checked to see if it is zero ?

a) A b) B

c) R1 d) R2.

v) If ready pin is grounded, it will introduce ..... states into the BUS Cycle of 8086/8088 microprocessors.

a) wait b) idle

c) wait and remains idle d) all of these.

vi) Whenever the POP H instruction is executed

a) data bytes in the HL pair are stored on the stack

b) two data bytes at the top of the stack are transferred to the HL reg. pair

c) two data bytes at the top of stack are transferred to the PC

d) two data bytes from HL reg. pair that were previously stored on the stack are transferred back to the HL registers.

vii) For 8255 PPI, the bidirectional mode of operation is supported in

a) mode 1 b) mode 2

c) mode 0 d) either (a) or (b).

viii) If a DMA request is sent to the microprocessor with a HI signal to the HOLD pin, the microprocessor acknowledge the request

a) after completing the present cycle

b) immediately after receiving the signal

c) after completing the program

d) none of these.

ix) STA 9000H is a

a) data transfer instruction

b) logical instruction

c) I/O and machine control instruction

d) none of these.

x) The segment and offset 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.

xi) The instruction register holds

a) flag conditions b) instruction address

c) opcodes d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. Explain the ALE IO/$\overline{M}$ signals of the 8085 microprocessor. Explain the need to demultiplex the bus $AD_7 - AD_0$.

3. What are interrupts ? How many interrupts are there ? What are maskable & non-maskable interrupts ? Discuss SIM instruction.

4. a) Write a ALP for a delay of 10 ms. Assume 3MHz to be the microprocessor clock frequency.

   b) What are stack & subroutine ? 3 + 2

5. What are the addressing mode available in 8085 ? Explain the instruction LDA & STA.

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

GROUP – C

(Long Answer Type Questions)

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

7. a) Draw the architecture of 8085 & mention its various functional blocks.

   b) Discuss the function of the following signals of 8085 :

   $\overline{\text{INTA}}$, HOLD, READY, SID, SOD. 10 + 5

8. a) Divide 76_H by 04_H, the data are stored in 8100_H and 8101_H memory locations respectively.

   b) Draw & explain the timing diagram for CALL instruction.

   c) Discuss instruction cycle, machine cycle and *T*-state.

   7 + 5 + 3

9. a) Write an ALP to find the sum of a series of 8 bit numbers, sum may be of 16 bits.

   b) Explain the sequence of events that takes place when the PUSH & POP instructions are executed. Illustrate the operation of stack instructions with suitable examples.

   c) Explain memory mapped I/O addressing and I/O mapped I/O addressing in 8085 microprocessor.

   5 + 5 + 5

10. a) In how many modes can 8255 operate ? Explain them.

    b) Show the control word format for I/O mode operation of PPI 8255.

    c) In mode 1, what are the control signals when port *A* & port *B* act as output ports. Discuss the control signals.

    d) Discuss the mode 1 & mode 2 in which 8254 can operate. 5 + 3 + 3 + 4

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