Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH/CSE(O)/IT(O)/PWE(O)/EEE(O)/SEM-5/EI-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) Which instruction is used to sense the pending interrupt ?

   a) SIM b) RIM

   c) EI d) None of these.

   ii) The number of programmable 8-bit register of 8085 microprocessor is

   a) 10 b) 6

   c) 8 d) 7.

iii) The PSW stands for

a) Accumulator

b) Flag byte

c) Accumulator and Flag byte

d) none of these.

iv) The instruction register holds

a) a flag condition b) opcodes

c) instruction address d) operands.

v) Which register keeps the current address of the next instruction to be executed ?

a) B-C b) SP

c) PC d) H-L.

vi) Which interrupt of the 8085 has the highest priority ?

a) RST 7·5 b) RST 6·5

c) RST 5·5 d) TRAP.

vii) Let the content of the accumulator is F8. After execution of RRC instruction, what will be the content of the accumulator ?

a) 9E b) 8C

c) 8B d) 7C.

viii) Which of the following is hardware interrupt ?

a) INTA b) TRAP

c) RST n d) INT.

ix) What happens when CALL 8000 is executed ?

a) Two data bytes stored in the top two locations of the stack are transferred to stack pointer

b) Two data bytes stored in the top two locations of the stack are transferred to program counter

c) It stores the current content of the program counter in the stack and then switches to the subroutine and executes the subroutine

d) The information where the stack is initialized is transferred to the SP.

x) What is the function of the instruction DAD B ?

a) It adds B and C registers

b) It adds B register to D register

c) It adds B-C register pair and H-L register pair

d) It adds B-C register pair and D-E register pair.

xi) How many channels are there in 8257 ?

a) Two b) Four

c) One d) Three.

GROUP – B

(Short Answer Type Questions)

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

2. What are the general purpose registers and special purpose registers in Intel 8085 microprocessor ? Explain the arrangement of flag bits in the flag register of Intel 8085 microprocessor. Also explain the functions of all the flag bits.

3. Draw the timing diagram for OUT 82H and MVI A, 02H instruction.

4. What are the addressing modes of Intel 8085 microprocessor ? Explain with suitable examples.

5. What do you mean by 8-bit microprocessor ? What are the functions of the following pins of 8085 ?

i) RESET, ii) READY, iii) INTR & iv) HOLD.

GROUP – C

(Long Answer Type Questions)

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

6. a) What are 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 in 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

7. 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 8086 differentiate between an opcode and data ? (3 + 3) + 3 + 3 + 3

8. 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 to processor with handshaking signals. Draw its timing diagram.

   3 + (2 + 2) + (2 + 3 + 3)

9. a) What is the advantage of DMA controlled data transfer over interrupt or program controlled data transfer ? Why the DMA controlled data transfer is faster ?

   b) Discuss the formats of the following registers of 8237.

   i) Command register ii) Mode register

   iii) Request register iv) Mask register

   v) Status register.

   c) Discuss the function of EOP signal of 8237. What do you mean by cycle stealing ?

   (2 + 1) + (2 + 2 + 2 + 2 + 2) + (1 + 1)

10. a) Explain the significances of different bits of the control word register format of 8253 PIT.

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

c) Briefly describe the modes of operation of 8279 ?

d) Calculate the execution time required for the instructions with the system frequency of 3 MHZ :

i) MOV C, D ii) MVI A, 05H

iii) DAD B iv) HLT.

3 + 5 + 3 + 4

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