ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2008

MICROPROCESSORS AND APPLICATIONS

SEMESTER – 6

Time : 3 Hours] [Full Marks : 70

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, 'ALE' 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) inform memory device that the address is being sent over the A/D line

d) inform I/O and memory that the data is being sent over the AD line. ☐

ii) In DMA operation, data transfer takes place between

a) Memory & CPU b) I/O & CPU

c) Memory & I/O d) Different CPUs. ☐

iii) Assume Intel 8086 real mode : The offset is 24H. The segment register contains 0B500H. What is resulting physical address ?

a) 0B524H b) 0B5024H

c) 24B5H d) 240b5H. ☐

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

a) $1/2^4$ b) $1/2^8$

c) $1/2^{12}$ d) $1/2^{16}$. ☐

v) Which of the following interrupt is both level and edge sensitive ?

a) RST 5·5 b) INTR

c) TRAP d) RST 7·5. ☐

vi) A single instruction to clear the lower four bits of the accumulator in 8085 assembly language is

a) XRI OHF b) ANI FOH

c) XRI FOH d) ANI OFH.

vii) Number of M-cycles in JMP is

a) 3 b) 6

c) 4 d) 5.

viii) Is the clock frequency, is 5 MHz, then the execution time of instruction of MVI B, 00h is

a) 1·8 μs b) 1·4 μs

c) 1·4 ms d) 0·4 ms.

ix) SID and SOD lines receive and transmit characters starting from which bit after the START bit ?

a) D_0 b) D_7

c) Neither D_0 nor D_7 d) Both (a) & (b).

x) The Hexcode of MVI A, 06H is

a) 3A b) 3E

c) 4F d) 0D.

xi) Let the accumulator content be 4F after execution of the RAL instruction, content of accumulator will be

a) 9E b) 8B

c) 8C d) 8D.

xii) What is the restart address for TRAP ?

a) 0024H b) 0034H

c) 003CH d) 0038H.

GROUP – B

(Short Answer Type Questions)

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

2. a) Specify the register contents and the flag status as the following instructions are executed. Specify also the data at PORT O.

	Initial Contents
MVI A, (F2) H	A = (00) H
MVI B, (7A) H	B = (FF) H
ADD B	S = 0
OUT PORT O	Z = 1
HLT	CY = 0

b) What do you mean by Conditional and Unconditional jump ? Give example. 3 + 2

3. What operation can be performed by using the instruction SUB A ? Specify the status of Z and Y. Write a program using ADI to add two hexadecimal numbers 3 AH AND 47 H AND TO DISPLAY THE answer at an output port. 5

4. a) What is T-State ?

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

c) What is multiplexed address/databus ? 1 + 2 + 2

5. a) What are the functions of 'program counter' and 'stack pointer' ?

b) Distinguish between 'Software Interrupts' and 'Hardware Interrupts' in 8085 Microprocessor. $2\frac{1}{2} + 2\frac{1}{2}$

6. a) Explain the function of the following routines :

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i)  LXI   SP, ( 8700 ) H
    PUSH  B
    PUSH  D
    POP   B
    POP   D
    RET.
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ii) LXI SP, (8800) H

MVI C, (00) H

PUSH B

POP PSW

RET.

b) Write a program (in Assembly Language) to add two Hex numbers (7A) H and (46) H and to store the sum in memory location (8898) H and flag status at (8897) H location. 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions. 3 × 15 = 45

7. a) Write an Assembly language programme to add first 10 natural numbers and store the result at memory location 2050 H.

b) The instruction code 01001111 (4FH) is stored in memory location 2005H. Explain the data flow and list the sequence of events when the instruction code is fetched by the MPU.

c) Discuss the operations performed by the PUSH and POP instructions.

6 + 5 + 4

8. a) i) What do you mean by subroutine ?

ii) Briefly discuss the sequence of events that takes place while executing CALL instruction.

iii) With the help of diagrams, explain Multiple ending subroutine, Multiple calling subroutine and nesting.

b) Exchange the contents of DE register pair with that of HL register pair, using PUSH & POP instructions.

c) Explain the functions of RESET & READY pins of 8085 microprocessor.

d) What is the purpose of DMA controller ? 1 + 3 + 6 + 2 + 2 + 1

9. a) What is the difference between µP and µController ?

b) Write an 8051 assembly language program to multiply two bytes of data.

c) What is the function of the RS1 and RS0 bits of the PSW and PD bits of the PCON of the 8051 microcontroller ?

d) Explain the function of the following instructions :

i) XCHG

ii) DAD D

iii) STA8060H and LDA8069H. 2 + 4 + 3 + 6

10. a) What are the functions of EU and BIU in 8086 µP ?

b) What are the differences between MIN and MAX modes of 8086 ?

c) What is meant by 'pipelining' ? Show the neat sketch for this process in flow-chart form.

d) How odd & even address can be achieved for memory organization in 8086 µP system ? 4 + 4 + 2 + 5

11. a) Draw the block diagram of 8254 timer and briefly discuss its different sections.

b) What do you mean by Mode 0, Mode 1, Mode 2 operations of 8255 PPI ?

c) Discuss the control word format in the BSR Mode of 8255 PPI.

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

END