HALDIA INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION UNDER MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL)

Paper Code: PCC-CS 503

Paper Name: 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)

Choose the correct alternatives from the followings: 15 x 1 = 15

1. (i)In order to change the accumulator content from F6H to 6FH, the number of rotate instructions required will be

a)4 b) 2 c) 3 d) 8 [CO2]

(ii)Consider the following set of instructions. After execution the content of accumulator will be

MVI A, F8H
XRA A

a)FFH b) 00H c) 8FH d) F8H [CO3]

(iii) After the execution of RIM instruction, the accumulator contains 49H, which interrupt is pending?

a) RST 5.5 b) RST 6.5 c) RST 7.5 d) TRAP [CO4]

(iv) 8086 microprocessor supports _____ modes of operation.

a) 2 b) 3 c) 4 d) 5 [CO1]

(v)How many flip-flops are there in a flag register of 8085 microprocessor?

a) 4 b) 5 c) 7 d) 10 [CO1]

(vi) In 8085 microprocessor, the addressable memory is

a) 64 KB b) 1MB c) 4KB d) 16KB [CO5]

(vii) The number of software interrupt in 8085 is

a) 2 b) 3 c) 8 d) 5 [CO4]

(viii) The maximum number of available ports in 8255 is

a) 2 b) 3 c) 4 d) 6 [CO6]

(ix) In 8085 which addressing mode is also called inherent addressing mode

a) Direct b) Register c) Implicit d) Immediate [CO1]

(x) The number of machine cycles and T states present in DCX instruction of 8085 are

a) 1, 4 b) 2, 4 c) 1, 6 d) 2, 6 [CO2]

(xi) Size of each segment in 8086 is
a) 32KB b) 16KB c) 64KB d) 128KB [CO5]

(xii) In 8085 microprocessor, RST6 transfers program execution to following location
a) 0030H b) 0042H c) 0024H d) 0060H [CO4]

(xiii) A single instruction to clear the lower four bits of the accumulator in 8085 microprocessor is
a) XRI 0FH b) ANI F0H c) ANI 0FH d) XRI F0H [CO2]

(xiv) The total I/O space available in 8085 if I/O mapped I/O is used is
a) 64 b) 128 c) 256 d) 512 [CO5]

(xv) How many address lines is present in 8086 microprocessor?
a) 16 b) 20 c) 32 d) 40 [CO1]

Group – B
(Short Answer Type Questions)

Attempt any three from the followings: **3 x 5 = 15**

2. Draw the timing diagram of **MOV A,B** instruction of 8085 microprocessor. 5 [CO2]

3. (a) Draw the circuit used to generate the $\overline{MEMR}$ and $\overline{MEMW}$ signal in the 8085. 3 [CO5]

   (b) Explain why the number of output ports in the peripheral mapped I/O is restricted to 256? 2 [CO5]

4. Explain what is pipelining? How is it useful in 8086 microprocessor? 3+2 [CO1]

5. Explain mode 2 operation in 8255 PPI? What is handshaking? 3+2 [CO6]

6. What is meant by PSW? How can the flag register be stored in any location of the RAM? 2+3 [CO1]

Group – C
(Long Answer Type Questions)

Attempt any four from the followings: **4 x 10 = 40**

7. (a)Draw neatly, the timing diagram for the given instruction, clearly showing all the machine cycles.
   8050 CALL 9100 6 [CO2]

(b) How long would the processor take to execute the instruction LDA 1753H if the T-State duration is 2 μs? 4
[CO2]

8. (a)Briefly discuss how microprocessor executes a vector interrupt using stack and subroutine. 5
[CO4]

(b)Which interrupts are masked after the execution of the following instructions? 3

MVI A, $1D_H$

SIM
[CO4]

(c)Write down the addresses of interrupt service routine for RST 5.5 and TRAP. 2
[CO4]

9. (a) Compare the advantages and disadvantages of memory-mapped I/O and I/O mapped I/O. 4
[CO5]

(b) Write a subroutine to generate 2000 μs delay (i.e. 2 ms) for 8085 microprocessor and show how this code causes this amount of delay. Assume that operating clock frequency of 8085 is 2 MHz. 6
[CO3]

10. Write an ALP in 8085 to divide two hexadecimal numbers stored in the memory location 8000H and 8001H. Store the quotient and remainder in 8002H and 8003H. Draw the flow chart of the process. 7+3
[CO3]

11. What is meant by memory segmentation in 8086 microprocessor? What are the different segments available in the memory? Explain with an example how 8086 calculates the actual physical address in any segment. 3+5+2
[CO1]

12. Write an assembly language program in 8085 microprocessors to add three Hex no 12H, 13H, 14H and display the output from no. PORT A. Explain each instruction. Write algorithm and draw flow-chart. 4+3+3
[CO6]

Answer Key:

Group – A

1.(i) d	(ii) a	(iii) d	(iv) b	(v) b	(vi) a
(vii) c	(viii) c	(ix) b	(x) b	(xi) a	(xii) c
(xiii) b	(xiv) a	(xv) a	(xvi) c	(xvii) c	(xviii) b
(xix) c	(xx) c	(xxi) a	(xxii) c	(xxiii) c	(xxiv) a
(xxv) b	(xxvi) c	(xxvii) a	(xxviii) b	(xxix) c	(xxx) b

Group – B

Group – C

13. b) 26μs
14. b) RST 7.5 and RST 5.5 are masked

Note:

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Don't put anything in the header caption (Red mark line)
Put exact Paper Code and Paper Name.
Don't put any True/False type question in MCQs.
Don't put less / extra options in MCQs.
Repetition of question is highly prohibited.
Paper setters are requested to put answer of each question in the "Answer Key" section only. Don't highlight/put any answer in the question section.