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Paper Code: EC-409	Roll No.									

B.Tech.
(SEM IV) EVEN SEMESTER EXAMINATION, 2015-16
INTRODUCTION TO MICROPROCESSOR

[Time: 3 hrs.] **[Max. Marks: 100]**

Note- Attempt All Questions. All Questions carry equal marks.

1. Attempt any **four** of the following: [**5x4=20]**

(a) What are the basic constituents of Arithmetic Logic Design (ALU)? Describe the utility of Accumulator and Data register through example.
(b) What is a bus?Why is the data bus bidirectional?
(c) List the functions of ALE and IO/M signals of the 8085 microprocessor.
(d) Explain the need to Demultiplex the bus AD_7 - AD_0.
(e) What is the difference between Peripheral mapped I/O and memory mapped I/O.
(f) Explain the term Interrupt of a Microprocessor.

2. Attempt any **four** of the following: [**5x4=20]**

(a) Draw the functional Block Diagram of 8085 Microprocessor and Explain in brief.
(b) After a certain ALU operation the content of accumulator is 32H and known flags are CY-1 and AC-1.Based upon this information obtain the BCD number that would be present in accumulator after the decimal adjust accumulator operation.
(c) Explain the Execution of following instructions:
i). DAD rp ii). DAA iii). LHLD addr. iv). CMA
(d) Draw the different machine cycle and what is the time required, for the execution of instruction given below if operating frequency of 8085 is 2 MHz:

Memory location	Machine code	Instruction
2000H	3EH	MVI A, 32H; Load byte 32H in the accumulator
2001H	32H	

(e) Write the instruction to load the number 2050H in the register pair BC. Increment the number using INX B and illustrate whether the INX B instruction is equivalent to the instructions INR B and INR C.
(f) The memory location 2050H holds the date byte F7H.Write instructions to transfer the data byte to the accumulator using three different opcodes : MOV ,LDAX and LDA. Also give your comments.

3. Attempt any **two** of the following: [**10x2=20]**

(a) Write a program to generate a square wave with period of 400 µs, use bit Do to output the square wave.
(b) Specify the registers content and flag status as the following instructions are executed:

i)
```
SUB  A
MOV B,A
DCR  B
INR  B
SUI  01H
HLT
```

ii)
```
XRA   A
MVI   B, 4AH
SUI   4FH
ANA   B
HLT
```

iii)
```
MVI A, 23H
MVI B, 32H
XRA B
ADI 88H
HLT
```

(c) Specify the contents of memory locations XX70 to XX74 after execution of following instructions:

```
        LXI H,XX70H
        MVI B,05H
        MVI A,01H
STORE:  MOV M,A
        INR A
        INXH
        DCRB
        JNZ STORE
        HLT
```

4. Attempt any **two** of the following: [**10x2=20]**

(a) Write an assembly language program based on 8085 to MULTIPLY the two numbers stored in memory locations 2000H and 2001H respectively and place the result in memory location 2002H.

(b) Write an assembly language program based on 8085 to find the LARGEST number in a given series of FIVE numbers.

(c) Sixteen bytes of data are stored in memory locations at XX50H to XX5FH.Write a program to transfer the entire block of data to new memory locations starting at XX70H.

5. Attempt any **two** of the following: [**10x2=20]**

(a) Explain operation of Programmable interrupt controller 8259 with the help of diagram of internal architecture.

(b) How a keyboard and a seven segment LED is interfaced with 8085 microprocessor? Explain.

(c) Define DMA. Draw and explain the Block diagram of 8237 DMA Controller.