Birla Institute of Technology and Science Pilani, Hyderabad Campus
II Semester 2015-2016
CS/ECE/EEE/INSTR F241
Microprocessor Programming and Interfacing
Comprehensive Examination- Part A (Closed Book)
Time: 60 min. Date: 12-5-2016 MM: 40

(Note: Answer Part A on the Q-Paper itself and Part B on a separate answer sheet provided.)

ID No.:	**Name:**

1. How many instructions can be executed per second in 8086/8088? [1M]
   Answer:

2. Write down the addressing mode of 80386 which is not present in 8086 with an example. [2M]
   Answer:

3. Explain the instruction: **LDS BX, [SI]** [2M]
   Answer:

4. What is the effect of executing the instruction? [2M]
   MOV CX, [SOURCE_MEM]
   Where SOURCE_MEM equal to 0020H is a memory location offset relative to the current data segment starting at address 1A000H
   Answer:

5. The original contents of AX, BL, word-sized content of memory location SUM, and carry flag CF are 1234H, 0ABH, 0CDH, and 0, respectively. Describe the results of executing the following sequence of instructions: [4M]

   ADD AX, [SUM]
   ADC BL, 05H
   INC WORD PTR [SUM]

AX		SUM	
BL		CF	

6. If the contents of AL equal to -1 (in decimal) and the contents of CL is -2 (in decimal), what result is produced in AX by executing the following instructions? [2M]

   i) MUL CL ii) IMUL CL

MUL CL	H
IMUL CL	H

7.
```
0000 2000          DATA1 DW   1234H
0000 3000          DATA2 DW   2345H
00                            .CODE
                              .START UP
0017  BE  0000  R             LEA SI, DATA1
001A  BF  0002  R             MOV DI,OFFSET DATA2
```
   In the above snippet of the code, what is loaded into the registers SI and DI after the last two instructions. [2M]

   Answer: SI= _____H, DI = _____ H

8. The following hypothetical program runs in 8086 .What will be the contents of registers AX, BX and SP after execution. Assume initially AX=0000, BX=0000, SP=$FFFE_H$. [3M]

```
MOV AX, 2037H
MOV BX, 0543H
MOV SS, AX
MOV SP, BX
PUSH AX
PUSH BX
POP AX
PUSHF
ADD AX,BX
```

Answer: (In HEX)	
AX	
BX	
SP	

9. The following program is run on 8086 microprocessor : Main program is stored as given below whereas the subroutine is stored in address 2050H onwards , the return instruction for subroutine is stored in location 2064H. [2M]

Memory AddresssIn Hex	Instruction
2000H	MOV SP, 1050H
2003H	PUSH CX
2004H	PUSH DX
2005H	CALL 2050H
2008H	POP DX
2009H	END

At the completion of the execution of the above program, the instruction pointer of the 8086 will contain _____H and the stack pointer contains _____H.

10. In an 8086 microprocessor, if the instruction CMP AX, BX has been executed while the content of the accumulator is less than that of register BX. As a result, which flags will be affected? Write the status of the flags. [2M]
Answer:

11. The lines BHE'=0 and A_0 =1, will select_____ (upper/lower) byte from/to _____ (even/odd) address. [2M]

12. What is the range of clock frequency in 8086? How clock signal is generated in 8086? [2M]
Answer:

13. The total number of memory accesses involved (inclusive of the op-code fetch), when an 8086 processor executes the instruction CALL 2008H is _____ (near CALL). If the processor is working at 8 MHz – the total time taken to access the whole instruction is _____(**write in µsec**) [2M]

14. What is the use of wait states? [1M]

Answer:

15. Consider the following assembly language program. [2M]

```
        MOV BX, 1087H
        MOV AX, BX
        XOR AX, AX
START:  JMP NEXT
        MOV CX, 3355H
NEXT:   XOR BX, AX
        JMP START
        OUT 0FCH, AX
        END
```

The execution of the above program in an 8086 microprocessor will result in_____

16. If $\mathbf{A_{15}'A_{14}A_{13}}$ is used as the chip select logic of a 4K RAM in an 8086 system (where A_{19} to A_{16} =0), then its memory range will be _____H to _____H. [2M]

17. In which ICW the interrupt vector type number stored in 8259A?
Answer :
[1M]

18. What are the comparisons between 8086, 80286 and 80386? [4M]

Answer:

	8086	80286	80386
Data Bus width			
Addressable Physical Memory			
Virtual memory			

19. If the current RPL is 10 the tasks that can be accessed are the ones that have DPL of _____. _____.
[2M]