

M.M:60  
ID.NO:

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI  
EEE/CS/INSTR F241 II SEMESTER 2015-2016

MICROPROCESSOR PROGRAMMING AND INTERFACING  
Mid-Semester Exam (OPEN BOOK)

15-03-2016

DURATION: 90 MIN

Name:

Q1. Assuming 32-bit mode of operation in 80386. Translate from machine code to assembly code (a), and translate from assembly code to machine code (b). Write your answers in hexadecimal.

a) 89F3 10001001 11110011

[4M]

b) MOV BX, [SI]

Q2. Write another single instruction from the instruction set which perform the same function for each of the instruction below:

[3M]

a) DEC AX

b) LEA AX, DAT1

c) NOT AX

Q3. It is required to exchange two word-size data items located at DAT1 and DAT2 in the memory using stack. Write down the remaining instructions for the following code: [5M]

LEA AX, DAT1

LEA BX, DAT2

Q4. How many bytes of information will be pushed on to stack after the execution of each instruction. Also write the number of machine cycles required for these instructions. [4M]

1. CALL BX
2. PUSH A

Q5. Registers AX, BX, CX, DX contain the values 1111h, 2222h, 3333h, and 4444h. What will be the contents of each register after the execution of the following sequence of instructions? [4M]

PUSH AX  
PUSH CX  
PUSH BX  
PUSH DX  
POP AX  
POP CX  
POP BX  
POP DX

Q6. What will be the value in the CX register after executing the following code. [4M]

```
MOV AX, 1B05H  
MOV WORD PTR [BX+4], 49DEH  
XLAT  
MOV CX, AX
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Q7. For each of the following instructions executed on a 8086 processor (all the sub-parts are independent of each other). What will be the status of the following flags. Write your answers in the sequence given below. Write 'X' if the flag is not relevant after the operation, '1' when set, '0' if reset [6M]

a. MOV AX, 25FFH  
INC AL

OF= SF= ZF= ACF= PF= CY=

b. MOV AX, 67CDH  
ADD AL, 05H

OF= SF= ZF= ACF= PF= CY=

Q8. What will be the contents of AX after the execution of the following instructions. [4M]

a. MOV AL, 25H  
MOV CL, 80H  
MUL CL

b. MOV AL, 25H  
MOV CL, 80H  
IMUL CL

Q9. An array of byte sized elements is provided. Write an 8086 Assembly language program, which uses near procedure named CHEK. CHEK checks the value of each element of the array. If the value is greater than 15 then it adds 20 to the element else it leaves the element unchanged. The last element of the array is FFH which also should be left unchanged. The starting location of the array in data segment is 2000H:1245H. The procedure should leave all the registers unchanged. [12M]

Q10. An array of ASCII characters are stored in consecutive memory locations in data segment starting from the Offset Address STRING. The number of Characters in the array is 50. Each ASCII character is a seven bit code with the eighth bit (MSB) used as parity bit. Write an 8086 Assembly language program which checks each ASCII character in the array for its parity, leave the even parity character undisturbed and convert the odd parity characters into an even one using parity bit and without disturbing the ASCII value. [14M]