Computer Organization and Assembly Language (COAL)

Mid Term Spring 2021-Part2

Marks: 30 Time Allowed: 35 Minutes

**Instructions:**

**1. Submit handwritten solutions only. Your name and registration number must be written on each page of solution submitted by you. If in case, you fail to do so it will not be counted towards the grade.**

**2. Take images, put them in a pdf/word file and submit it on Teams/Portal.**

**3. Plagiarized answer sheets will be awarded Zero.**

**4. Show your work clearly to get full credit.**

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**Question 1: [5+5]**

1. For the given effects (Flag values) created by the following instructions find the value of Constant? Provide reason to get the full credit.

Note: AX contain the last 4 digits of Your registration number. If your Reg# Is L1S20BSCS0010 then last 4 digits are 0x0010.

|  |
| --- |
| MOV AX, Last 4 Digit of Your Registration Number  SUB AX, Constant  ; Find the value of Constant for which the following flag effect is created.  **AF=0, ZF=0, PF =0,CF=1, OF=1, SF=1** |

1. If CS=24F6H and IP=634AH, determine:

a) The offset address

b) The physical address

c) The lower range of the code segment

d) The upper range of the code segment

e) The address of Next instruction

**Question 2: [10]**

Consider the following assembly program. What changes are made in the affected memory locations after execution of following instructions? Highlight the changes and the relevant memory locations by modifying the given memory patch and rewriting it. Initial value of all the register is zero.

Note: DS = 0xA000, SS = 0xB000, CS = 0xC000 and ES=0

|  |  |
| --- | --- |
| **MOV AX, [0XBCCF]**  **MOV BX, [0XBCD0]**  **SUB AX, BX**  **MOV [0XBCD3], AX**  **ADD [0XBCD1], AX**  **SHL WORD[0xBCD7],16**  **RCL WORD[0xBCDB]**  **ADC [0xBCDD],0** | DATA ADDRESSES  Figure **Memory** |

**Question 3: [10]**

Write a program which could search last four digits of your registration number from a given array **Reg,** consist of 20 random numbers. A counter Array **Count** which should count and save the number of occurrences of each digit.

**For example**

Registration number is L1S21BSCS**1234**

**Before execution**

Reg: dw 1 ,5, 3, 9, 4, 2, 8, 6, 7, 0, 1, 5, 8, 9, 0, 4, 4, 2, 5 ,6

Count: db 0,0,0, 0

**After execution**

Count : db 2, 2, 1, 3