EE213 Computer Organization and Assembly Language
Quiz II – FALL 2018 (Section B | D)
October 29th, 2018
Solution Paper-B

1. Write a procedure that should swap the values of AX in and DX in such a way that whatever is stored in AX, after swapping DX would hold reverse of it, and vice versa. (For instance, given that `AX = ABCDh`, `DX = 7654h`, after swapping: `AX = 4567h` and `DX = DCBA`). Make use of stack and Shift/Rotate instructions only. **[4 Points]**

```
XCHG    AH,AL
ROL     AH,4
ROL     AL,4
PUSH    AX
XCHG    DH,DL
ROL     DH,4
ROL     DL,4
PUSH    DX
POP     AX
POP     DX
```

2. What does EAX contain after execution of following instructions? **[2 Points]**

```
MOV     EAX, 01h
MOV     EBX, 03h
MOV     ECX, 10h
L1:     SHL EAX, 1
DEC     ECX
SUB     EBX, 1
LOOPNE  L1
```

EAX= 00000008h

3. Copy the second last element (second most recent) of the stack into ECX without disturbing ESP. **[2 Points]**

MOV ECX, [ESP+4]

4. Given that multi-level encryption is implemented in the following code. Provide encrypted values in AX/AL after each encryption and write down working decryption key for each encryption. **[4 Points]**

```
MOV AL, 04h
MOV CL, AL
; encryption1
CBW
INC AH
XOR AX, 04h                 ; AX ?
; encryption2
ROL AH, CL
DEC CL
SHL AX, CL
TEST AX, 0FFFFh             ;AX?
```

; ***decryption2***

```
        SHR AX, CL
        INC CL
        ROR AH, CL
; decryption1
        XOR AX, 04h
        DEC AH
```

5. Using recursion, calculate and display the 11th positioned to 15th positioned elements of Fibonacci Series, also draw out the stack (stack frame) for your code. [**4+2 Points**]

FREE REPONSE