EE213 Computer Organization and Assembly Language
Quiz II (GR I) – Spring 2019
March 29th, 2019
Paper-B
Student Name: _____ Roll#_____

Solve the following questions.

1. Implement the following pseudo-code in assembly language. Also, give the corresponding data definition directives: **[04 points]**

```
; All values are 32-bit unsigned integers
do {
      X = Y + 2;
      if (C == B)
         {A^2}
      else
            --X;
            X = Y + 10;
      }
      while(A < = B)
```

SOLUTION:

```
L1:   MOV   EAX, Y
ADD   EAX, 2
MOV   X, EAX            ;     X = Y + 2

MOV   EAX, B
CMP   EAX, C
JNE   L2
MOV   EAX, A
MUL   A
MOV   A, EAX            ;     A = A^2
JMP   L3

L2:   DEC   X           ;     --X
MOV   EAX, Y
ADD   EAX, 10
MOV   X, EAX

L3:   MOV   EAX, A
CMP   EAX, B
JBE   L1
```

2. Provide the contents of registers where indicated (in hex-decimal), after execution of the following instructions. **[2 Points]**

```
mov     al, 10h
not     al              ; a. 0EFh

mov     al, 13h
and     al, 31h         ; b. 11h

mov     al,BBh
or      al,35h          ; c. 0BFh

mov     al,7Ah
xor     al,0DCh         ; d. 0A6h
```

3. Elaborate the difference between SHL and SHLD through some working example. **[2 Points]**

ANSWER:

SHL Instruction performs a logical left shift on the destination operand, filling the lowest bit with 0. The highest bit (msb) is moved to the Carry flag. For example:

```
mov dl,10           ; before: 00001010
shl dl,2            ; after:  00101000
```

The **SHLD** (shift left double) instruction shifts a destination operand a given number of bits to the left. The bit positions opened up by the shift are filled by the most significant bits of the source operand. For example:

```
.data
     wval WORD 9BA6h
.code
     mov   ax,0AC36h
     shld  wval,ax,4        ; wval = BA6Ah
```