EE213 Computer Organization and Assembly Language
Quiz II (GR 2) – 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 16-bit signed integers
do {
      if (C %B == 1)
            C= C*B;
            A++;
      else
            C = C/B;
            A++;
      }
      while(C > 0)
```

Solution:

```
L1:         MOV   AX, C
MOV         DX, 0

IDIV        B           ; DL = C%B
MOVZX       AX, DL      ; AX = C%B

CMP         AX, 1       ; IF C%B == 1
JE          L2          ; THEN JUMP TO L2

MOV         AX, C       ; ELSE
IDIV        B           ; AX = C/B
MOV         C, AX       ; C = C/B
INC         A           ; A++
JMP         L3

L2:         MOV   AX, C
IMUL        B           ; DX:AX = C*B
MOV         C, AX       ; C = C*B
INC         A           ; A++

L3:         MOV   CX, C ;while
CMP         C, 0
JG          L1
RET
```

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

```
mov     al, 77h
sar     al, 4           ; AL = 07h      CF = 0

mov     al, 255
add     al, 1
rcr     al, 4           ; AL = 10h      CF = 0

mov     al, 9Bh
rol     al, 4           ; AL = B9h      CF = 1

mov     al, C7h
shr     al, 7           ; AL = 01       CF = 1
```

3. Elaborate the difference between AND and TEST instructions through some working example. **[2 Points]**

ANSWER: **TEST** instruction does not affect destination.

E.g.

```
MOV         AL, 0000 1111b
TEST        AL, 1111 0000b              ; AL = 0000 1111b, ZF = 1
AND         AL, 1111 0000b              ; AL = 0000 0000b, ZF = 1
```