EE213 Computer Organization and Assembly Language
Quiz II_**Section-B**_Fall 2019
October 31, 2019
Paper-B
Student Name: _____Roll#_____

1. Given the following array write a recursive procedure to replace each of the following elements in the array with its mathematical twice value. [4 Points]

```
array       SWORD       1,-2,-3,4,-5,6,-7,8,-9,-10
```

2. Given that following code is some snippet from an encryption algorithm, where ax = 90h, dx =07h, and cx= 4. Write the encrypted value in AX, and correct decryption code for the following snippet. [4 Points]

```
not   ax
rol   dl, cl
rcl   al, cx
xor   cx, 2
ror   al, cx
stc
rcl   al, 5
xchg  al, ah
add   al, 7
add   al, dl
```

3. Write the equivalent assembly code for following procedure and draw out the stack frame. Do not use ENTER/LEAVE, USES, and LOCAL directives. (Assume ESP = 00FF 3232h, and EBP = 1000 1000h, initially). [4 Points]

```
void main(){
  char a[]={100,81,64,49,36,25,16,9,4,1};
  roots(a);
}
```

```
void roots(char arr[]){
      char count = 10;
      for(int i=0;i<10;i++){
            arr[i] = arr[i]/count;
            count--;
      }
}
```

```
main   proc
       push   ebp
       mov    ebp,esp
       sub    esp, 13
       mov    [ebp-4], 100
       mov    [ebp-5], 81
       .
       .
       mov    [ebp-13], 1
       INVOKE roots, offset [ebp-4]
       add    esp,4        ;cleaning the past arguments
       mov    esp, ebp     ;cleaning local data
       pop    ebp
       ret
main   endp

roots  proc, p:ptr byte

       push   ebp
       mov    ebp,esp
       mov    esi, p       ;pointer to x[]
       sub    esp, 4
       mov    [ebp-4], 10  ;count value
       mov    cx,10

       L1:    mov    ax,0
              Mov    al, [esi]
              div    [ebp-4]
              mov    [esi], al
              sub    esi, 1
              sub    [ebp-4], 1
       loop   L1

       mov    esp,ebp
       pop    ebp
       ret
roots  ENDP
```

00FF 322E	Ret address(system)	MAIN'S STACK FRAME
00FF 322A	1000 1000h (ebp pushed)	
00FF 3226	100	
00FF 3225	81	
00FF 3224	64	
00FF 3223	49	
00FF 3222	36	
00FF 3221	25	
00FF 3220	16	
00FF 321F	9	
00FF 321E	4	
00FF 321D	1	
00FF 321C	00FF 3226 (Argument)	ROOTS' STACK FRAME
00FF 3218	Return Address(main)	
00FF 3214	00FF 322Ah (ebp pushed)	
00FF 3210	10 (count)	