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Part 1- 20 multiple choice questions (each 2 points)

1- For any two integers *n* and *m*, ((*n* XOR *m*) XOR *m*) produces *n*.

2- The TEST instruction always alters the destination operand.

3- XORing an operand with 1 always causes the Zero flag to be set.

4- ANDing an operand with 1 sets the zero flag if the operand was originally an even number.

5- The Parity flag indicates whether the lowest byte of a destination operand has an even number of 1 bits.

6- The XOR instruction inverts each bit in a destination operand.

7- The JBE instruction is used when comparing unsigned integers.

8- The OR instruction can be used to find the intersection of two bit-mapped sets.

9- With unsigned operands, the CMP instruction sets the Carry flag when the destination operand is less than the source operand.

10- With signed operands, the CMP instruction makes the Sign flag equal to the Overflow flag when the destination operand is less than the source operand.

11- The MUL instruction sets the Overflow flag if the upper half of the product is not equal to zero.

12- When the MUL BX instruction executes, the 32-bit product ends into the EAX register.

13- The binary value of AL after the following instructions have executed is 00001101.

```
mov al,01101011b
shr al,2
```

14- The binary value of AL after the following instructions have executed is 11101101.

```
mov al, 01101011b
rol al,2
```

15- The hexadecimal values of DX and AX after the following instructions have executed are DX=0005 and AX=0000.

```
mov dx,5000h
mov ax,20h
mul dx
```

16- The following is a valid LOCAL declaration?

```
LOCAL index:DWORD
```

17- In 32-bit programs, ADDR and OFFSET return the same value.

18- An indirect operand such as [eax + edi] can be passed to the INVOKE directive.

19- The C calling convention requires the calling program to reset the stack pointer after the subroutine has returned.

20- When a subroutine argument is passed by value, the calling program pushes the argument's address on the stack.

Part 2- 6 comprehensive problems each 10 points)

1- In the following instruction sequence, show the resulting value of AL where indicated, in hexadecimal:

```
mov   al,7Ah
not   al              ; a.
mov   al,3Dh
and   al,74h          ; b.
mov   al,9Bh
or    al,35h          ; c.
mov   al,72h
xor   al,0DCh         ; d.
```

2- What will be the final value in EDX after this code executes?

```
      mov   edx,1
      mov   eax,7FFFh
      cmp   eax,8000h
      jl    L1
      mov   edx,0
L1:
```

3- What will be the final value in EDX after this code executes?

```
        mov     edx,1
        mov     eax,7FFFh
        cmp     eax,8000h
        jb      L1
        mov     edx,0
L1:
```

4- In the following code sequence, show the value of AL after each shift or rotate instruction has executed:

```
mov     al,0D4h
ror     al,3            ; a.
mov     al,0D4h
rol     al,7            ; b.
stc
mov     al,0D4h
rcl     al,1            ; c.
stc
mov     al,0D4h
rcr     al,3            ; d.
```

5- What will be the contents of EAX and EDX after the following operation?

```
mov     eax,123400h
mov     edx,0
mov     ebx,10h
div     ebx
```

6- In the following instruction sequence, show the values of the Carry, Zero, and Sign flags where indicated:

```
mov     al,00001111b
test    al,00000010b        ; a.    CF=     ZF=     SF=
mov     al,00000110b
cmp     al,00000101b        ; b.    CF=     ZF=     SF=
mov     al,00000101b
cmp     al,00000111b        ; c.    CF=     ZF=     SF=
```