

:: FINAL TERM EXAM ::

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Note Attempt All Questions.

Q: 8(a)

Answer:

```
push ebx
push eax
pop ebx
pop eax
```

Q: 8(b)

Answer:

~~Include~~

```
INCLUDE Irvine32.inc
```

```
WriteString PROTO
```

```
.data
```

```
source BYTE "This is the source string", 0
```

```
target BYTE SIZEOF source DUP('#')
```

```
.code
```

```
main PROC
```

```
mov esi, 0
```

```
mov edi, LENGTHOF source - 2
```

```
mov ecx, SIZEOF source
```

```
L1:
```

```
mov al, source [esi]
```

```
mov target [edi], al
```

```

inc esi
dec edi
loop L1
mov edx, OFFSET target
Call WriteString
exit
main ENDP
END main

```

Q: 8(c)

Answer:

```
INCLUDE Irvine32.inc
```

• data

```

loopcount DWORD ?
foreground DWORD ?
background DWORD ?

```

• code

```
main PROC
```

```
mov ecx, 16;      Outer loop count.
```

```
L1:
```

```
mov loopcount, ecx
```

```
mov foreground, ecx
```

```
dec foreground;  Foreground initial value = 15 decrement which will
```

```
mov ecx, 16;      Inner loop count
```

```
L2:
```



```
mov background, ecx
dec background; Background initial value = 15
```

```
mov eax, background; Set EAX = background
shl eax, 4; Shift left, equivalent to multiplying EAX by 16
add eax, foreground; Add foreground to EAX
call settextcolor
mov al, "A";
call writechar;
loop L2
call crlf;
mov ecx, loopcount
loop L1
```

```
exit
main ENDP
END main
```

Q:5

Answer:

```
mov al, [esi+3]; (a) AL = 40h
```

```
mov ax, [esi]; (b) AX = 003Bh
```

```
mov edx, myDoubles[edi]; (c) EDX = 3
```

Q: 3

Answer:

```

.data
myBytes    BYTE 10h, 20h, 30h, 40h
myWords    WORD 3 DUP(?, 2000h)
myString   BYTE "ABCDE"
.code

```

```

mov eax eax, TYPE    myBytes ; (a) EAX = 1
mov eax, LENGTHOF    myBytes ; (b) EAX = 4
mov eax, SIZEOF      myBytes ; (c) EAX = 4
mov eax, TYPE        myWords ; (d) EAX = 2
mov eax, LENGTHOF    myWords ; (e) EAX = 4
mov eax, SIZEOF      myWords ; (f) EAX = 8
mov eax, SIZEOF      myString ; (g) EAX = 5

```

Q: 4

Answer:

```

.data
val32 LABEL DWORD
varB   BYTE 78h, 56h, 34h, 12h
val8   LABEL BYTE
varD   DWORD 12345678h
.code

```

```

mov bl, BYTE PTR varD ; (a) BL = 78h

```


`mov eax, DWORD PTR varB ; (b) EAX = 12345678h`
`mov al, val8 ; (c) AL = 78h`
`mov eax, val32 ; (d) EAX = 12345678h`

Q # 1

Answer:

- (a) CX = 009Bh
- (b) CX = 009Bh
- (c) val2 = 1000h
- (d) AL = 20h
- (e) AX = 200h
- (f) EAX = 20000h

Q # 2

Answer:

- a) CX = 0, ZF = 1
- b) CX = -1, SF = 1
- c) AL = 00, CF = 1
- d) AL = FF, CF = 1
- e) AL = 80h, OF = 1
- f) CF = 0, OF = 1

Q # 7

Answer:

a)

```
mov eax, var1
cmp eax, var2
jle L1
mov var3, 110
mov var4, 90
jmp L2
L1: mov var3, 128
L2:
```

b)

```
cmp val1, ecx
ja L1
cmp ecx, edx
ja L1
mov X, 30
jmp next
L1: mov X, 40
next:
```


c) while:

```

cmp  eax, ebx';  check loop condition
jae  -endwhile;  false? exit loop
inc  eax;        body of loop
jmp  -while;     repeat the loop
- endwhile:

```

Q#6

Answer:

a) We can convert the character in AL to upper case in two ways
By using and operation.

```

mov al, 'A'; al = 0100
mov al, 'a'; al = 01100001b
and al, 11011111b; al = 01000001b

```

By using or operation:

```

mov al, 'A'; al = 01000001b
or al, 00100000b; al = 01100001b

```

(P.T.O)

b) Using the OR instruction to set bit 4 ^{and} 5.

mov al, 6; al = 0000 0110b
or al, 00110000b; al = 0011 0110b

* The ~~ASCII~~ ASCII digit of '6' = 00110110b

c) and al, 00001011b; clearing unwanted bits
cmp al, 00001011b; check remaining bits
je L1; all set? jump to L1