

FINAL-TERM EXAMINATION

SUBJECT # ASSEMBLY LANGUAGE

I.D # 13131

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Q7) Use the following variable definitions for the coming question:
 What will be the value of the destination operand after each of the following instruction execute in sequence?

; (a) EAX = 10

; (b) EAX = 8

; (c) EAX = 2000

; (d) AX = 1000 (e) VALD = 3000

; (f) VALD = 20

; (g) AL = 50

; (h) AL = 40

; (i) AX = 60

; (j) AX = 1000

; (k) EAX = 30

; (l) EAX = 02709

Q2) write down the value of the Carry, Sign, Zero & overflow flags after each instruction has executed.

mov ax, 7FF0h

add al, 10h ; (a) CF=1 SF=0 ZF=1 OF=0

add ah, 1 ; (b) CF=0 SF=1 ZF=0 OF=1

add ax, 2 ; (c) CF=0 SF=0 ZF=0 OF=0

mov al, 1

sub al, 2 ; (d) CF=1 SF=1 ZF=0 OF=0

Q3) Use the following data definitions for the coming question

.data

listB BYTE 60h, 50h, 40h, 30h, 20h, 10h

listW WORD 4 DUP (?), 1000h

String1 BYTE ("Assembly language", 0)

i) what will be the value of EAX after each of the following instructions execute?

; (a) EAX = 1

; (b) EAX = 6

; (c) EAX = 6

; (d) EAX = 2

; (e) EAX = 6

; (f) EAX = 10

; (g) EAX = 12

ii) write an instruction that move all four bits in list B to the EAX register.

Ans) EAX register is the single register value.

iii) Ans) list B register is to move register directly to EAX register.

Q4) use the following data definitions for coming question:
 what will be the value of the definition operand after each of the following instruction execute in sequence

;(a) AL = 10h

;(b) EAL = 40h

;(c) AX = 003Bh

;(d) EBX = 3

;(e) EDX = 3

;(f) EAX = 2

Q5) implement the following pseudocode in assembly language:

i)

SOLUTION :-

mov ax, var1

cmp ax, var2

jle L1

mov var3, 10

mov var4, 30

jmp L2

L1 : mov var3, 15

L2 :

ii)

SOLUTION :-

```

loop cmp val, ecx
        jnc L1
        cmp ecx, edx
        jna L1
        mov A, 12
        jmp next
L1 :    mov B, 6
next :

```

iii)

SOLUTION :-

```

top :  cmp ecx, ebx ; check loop condition
        jae next    ; false? exit loop
        inc ecx    ; body of loop
        jmp top    ; repeat the loop
next :

```

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(D6i) what will be the final value of EAX in this example?

Ans) The program does not stop, because the first loop instruction decrements ECX to zero. The second loop instruction decrements ECX to FFFFFFFFh, causing the outer loop to repeat.

ii) write a program that calculate the following expression, using registers:
 $A = (A+B) - (C+D)$

SOLUTION :-

.386

.model flat,stdcall

.stack 4096

ExitProcess proto, dwExitCode:dword

~~data~~

.code

main1 Proc

; calculate Res = (A+B) - (C+D)

;

; calculate (A+B) - (C+D)

;

; Save the result in Res

invoke ExitProcess, 0

main1 endp

end main1

iii) write a program that uses a loop to copy all the elements from an unsigned word array into an unsigned doubleword array.

SOLUTION:

.386

.model flat,stdcall

.stack 4096

ExitProcess PROTO,

dwExitCode: DWORD

.data

array WORD 0,2,5,9,10

newArray DWORD LENGTHOF array
DUP(?)

.code

main PROC

mov ecx, LENGTHOF array

mov esi, OFFSET array

mov edi, OFFSET newArray

L1:

MOV EAX, 0

MOV AX, [ESI]

MOV [EDI], EAX

ADD ESI, TYPE array

ADD EDI, TYPE newArray

LOOP L1

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```
Invoke ExitProcess, 0  
main ENDP  
END main
```

- c) write a program that displays a string in all possible combinations of foreground & background colors ($16 \times 16 = 256$). The colors are numbered from 0 to 15, so you can use a nested loop to generate all possible combinations. Also use a delay of 1s in each foreground color change.

SOLUTION:-

INCLUDE Irvine32.inc

.data

Count DWORD ?

.code

main PROC

mov eax, 0 + (0 * 16)

mov ecx, 16

L1:

mov count, ecx

push eax

mov ecx, 16

L2:

call SetTextColor

push eax

mov al, 'H'

call writechar

pop eax

inc ecx

Loop L2

call crt

pop eax

add eax, 16

mov ecx, count

Loop L1

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Call crit
Call waitmsg
exit
main ENDP

END main