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23K-0727 Assignment 2 3J Date______20__

Question 1:-

a) EAX = 0000 000Dh
ECX = 0000 00DDh
EDX = 0000 ABCDh
ESP = 0000 0FFFh

```
Add AX, 1        ; AX = 000Eh
inc DH           ; DH = AC
Push EAX
```

0E	
00	
00	
00	← ESP = 0000 0FFBh

```
Push ECX
```

0E	
00	
00	
00	
DD	
00	
00	
00	← ESP = 0000 0FF7h

```
cmp CH, 0        ; CH = 00   ZF = 1
Jnz L1
Push ECX
```

0E
00
00
00
DD
00
00
00

→

DD	
00	
00	
00	← ESP = 0000 0FF3h

Pop EBX ; EBX=0000 00DDh

0E	
00	
00	
00	
DD	
00	
00	
00	← ESP=0000 0FF7h

L1: NOT DL ; DL=32h

Push EDX

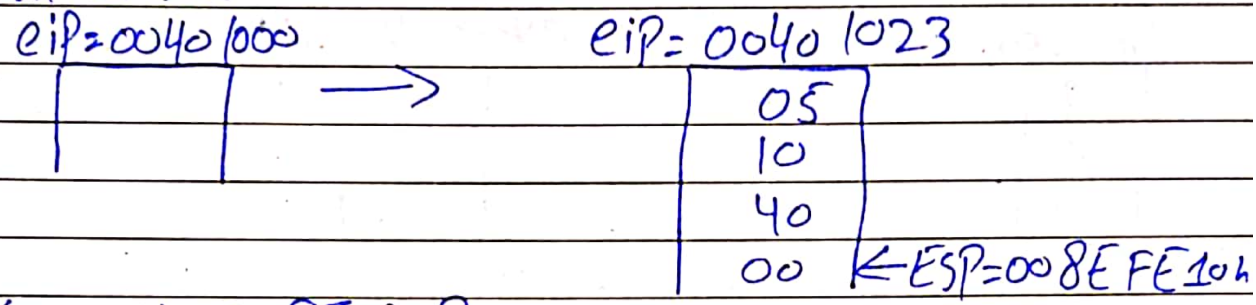
0E	
00	
00	
00	
DD	
00	
00	
00	
32	
AC	
00	
00	← ESP=0000 0FF3h

Pop EAX ; EAX=0000 AC32h

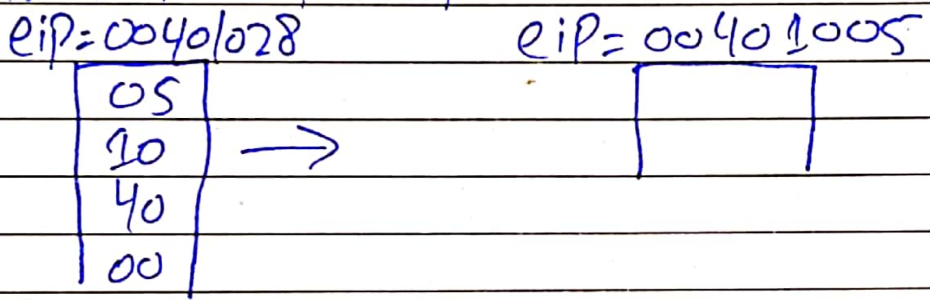
0E	
00	
00	
00	
DD	
00	
00	
00	← ESP=0000 0FF7h

End values
EAX=0000 AC32h
EBX=0000 00DDh
ECX=0000 00DDh
EDX=0000 AC32h

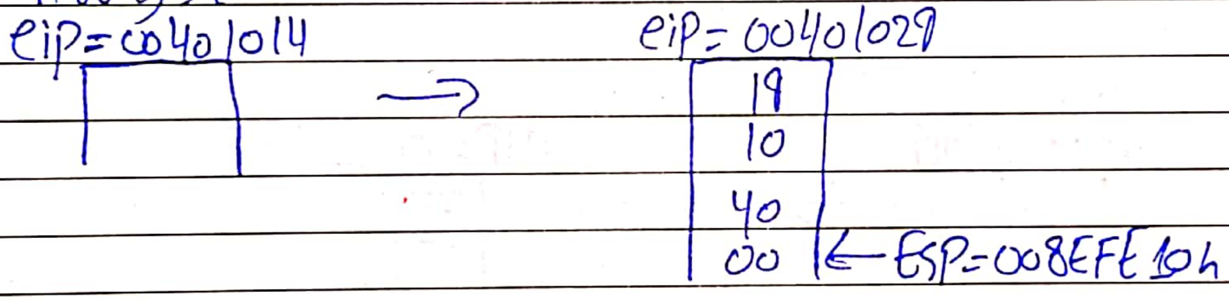
b) 1) call Clrscr



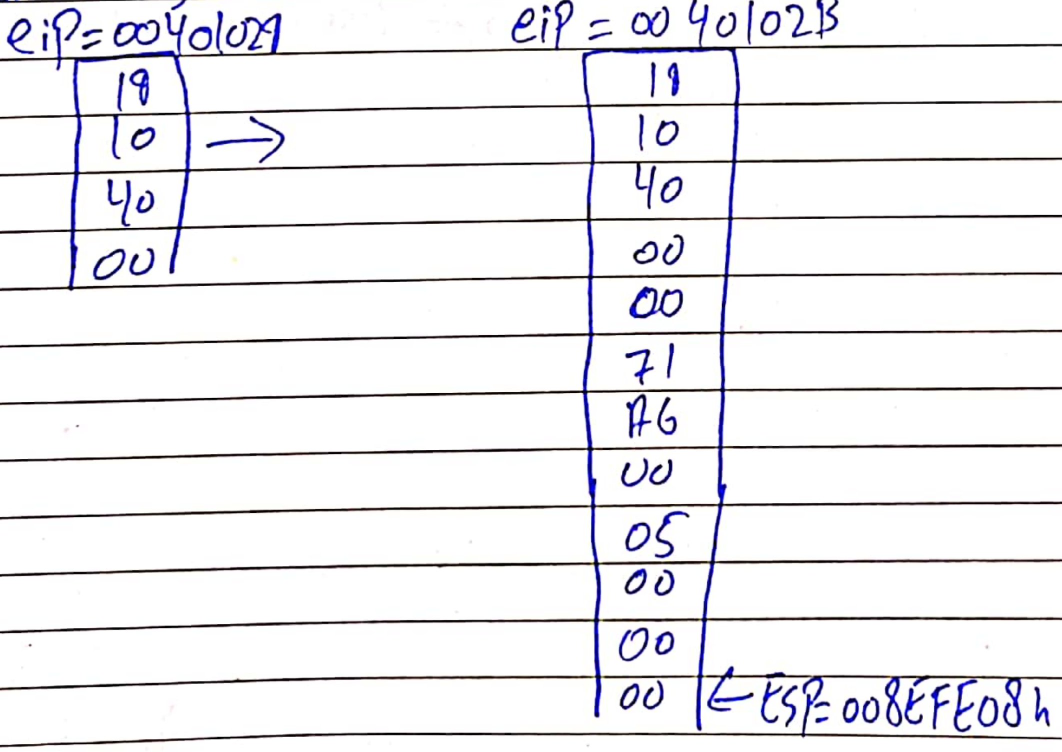
2) ret from Clrscr ~~Proc~~ Proc



3) call ArraySum



4) uses esi,ecx



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5) ret from Arraysum Proc

eip=0040103B → eip=00401019

19
10
40
00
00
71
A6
00
05
00
00
00

6) Push 0

eip=00401019 → eip=0040101E

00
00
00
00 ← ESP=008E FE10h

Question 2:-

a)
```
INCLUDE Irvine32.inc
.data
 ArrList  BYTE  "computer organization and assembly language",0
 toReplace  BYTE  ?
 msgFound  BYTE  "Here is the updated array or string",0
 msgNFound BYTE  "Sorry, Character not found in the array or string",0

 .code
 main PROC
   mov edx, OFFSET ArrList
    call Writestring
    call Crlf
    mov eax, 0
    call ReadChar
    mov toReplace, al
   mov ecx, ~~SIZEOF~~ SIZEOF ArrList
   mov esi, OFFSET ArrList
   mov ebx, 0            ; used as a flag if char found ebx=1 else ebx=0
Compare:
             mov al, [esi]
             cmp al, toReplace
              jne NextChar
                mov BYTE ptr [esi], '@'
                mov ebx, 1
    NextChar:
                 inc esi
                 loop compare
                 cmp ebx, 0
                 je NotFound

                mov edx, OFFSET msgFound
```

```
        call writestring
        Call Crlf
        mov edx, OFFSET ArrList
         call writestring
         call Crlf
          jmp Finish
   Notfound:
           mov edx, OFFSET msgNFound
            call writestring
            call Crlf
  Finish:
   exit
   main ~~ENP~~ ENDP
   END main
```

h) INCLUDE Irvine32.inc

```
 .data
myArray DWORD 100 DUP(?)
 j DWORD ?

.code
main PROC
 Begin:
     mov eax, j
     cmp eax, 0
     jl Finish
      cmp eax, 100
     jg Finish
     mov esi, OFFSET myArray
     mov ebx, j
      mov ecx, ebx
       inc ecx
```

```
        mov edx, [esi + ebx*4]
        mov [esi+ecx*4], edx
        dec j
        jmp Begin
    Finish:
     exit
     main ENDP
     END main
```

Question 3:-

```
a) 1) mor cl, 2      ;     cl = 02h,        CF = 0
   2) mov al, 8ch    ;     cl = 02h,  al = 8ch,  CF = 0
   3) mov bl, c8h ; cl = 02h, bl = 0c8h,  al = 8ch,  CF = 0
   4) Shl al, cl     ; al = 30h ,  CF = 0
   5) Shr bl, cl     ; bl = 32h ,  CF = 0
   6) inc cl         ; cl = 03h ,  CF = 0
   7) Sar bl, cl     ; bl = 06h ,  CF = 0
   8) Rol al, cl     ; al = 81h ,  CF = 1
   9) clc            ; CF = 0 ,  al = 81h ,  bl = 06h ,  cl = 03h
  10) dec cl         ; cl = 02h ,  CF = 0
  11) Rcl al, cl     ; al = 05h ,  CF = 0
  12) STC            ; CF = 1 ,  al = 05h ,  bl = 06h, cl = 02h
  13) Rcr bl, cl     ; bl = 41h,  CF = 1
  14) Shrd al, bl, 2 ; al = 50h ,  bl = 41h ,  CF = 0
  15) Shld bl, al, 2 ; al = 50h ,  bl = 05h ,  CF = 1
```

b) Assuming time is stored in DX

```
INCLUDE Irvine32.inc
.data
  Seconds  WORD ?
  Minutes  WORD ?
  Hours    WORD ?
```

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```
  .code
  main PROC
  mov dx, ~~[illegible]~~ 0101010101010101b
  mov al,dl
  and al, 00011111b
  mov Seconds, ax
  mov ax, dx
  shr ax, 5
  and ax, 11111b
  mov Minutes, ax
  mov ah,dh
  shr ah,3
  mov Hours, ax
exit
main ENDP
END main
```