**Assignment number: 11**

**Subject: MICROPROCESSOR LAB**

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Class: ***SECOND YEAR ENGINEERING***

Division: ***B***

Roll no: ***222008***

Batch: ***B1***

**PROBLEM STATEMENT:**

Write 80387 ALP to find the roots of the quadratic equation. All the possible cases must be considered in calculating the roots.

**Code:**

%macro scall 4

mov rax,%1

mov rdi,%2

mov rsi,%3

mov rdx,%4

syscall

%endmacro

;-----------------------------------------------------------------------

section .data

m1 db "Complex Root",10

l1 equ $-m1

m2 db 10,"Root1: "

l2 equ $-m2

m3 db 10,"Root2: "

l3 equ $-m3

new db 10

newl equ $-new

a dd 1.00

b dd 8.00

c dd 15.00

four dd 4.00

two dd 2.00

hdec dq 100

point db "."

;------------------------------------------------------------------------------

section .bss

root1 resd 1

root2 resd 1

resbuff rest 1

temp resb 2

disc resd 1

;-----------------------------------------------------------------------------

section .text

global \_start

\_start:

finit

fld dword[b]

fmul dword[b]

fld dword[a]

fmul dword[c]

fmul dword[four]

fsub

ftst

fstsw ax

sahf

jb no\_real\_solutions

fsqrt

fst dword[disc]

fsub dword[b]

fdiv dword[a]

fdiv dword[two]

scall 1,1,m2,l2

call disp\_proc

fldz

fsub dword[disc]

fsub dword[b]

fdiv dword[a]

fdiv dword[two]

scall 1,1,m3,l3

call disp\_proc

scall 1,1,new,newl

jmp exi

no\_real\_solutions:

scall 1,1,m1,l1

exi :

scall 1,1,new,newl

mov rax,60

mov rdi,1

syscall

disp\_proc:

FIMUL dword[hdec]

FBSTP tword[resbuff]

mov rsi,resbuff+9

mov rcx,09

next1:

push rcx

push rsi

mov bl,[rsi]

call disp

pop rsi

pop rcx

dec rsi

loop next1

push rsi

scall 1,1,point,1

pop rsi

mov bl,[rsi]

call disp

ret

disp:

mov edi,temp

mov ecx,02

dispup1:

rol bl,4

mov dl,bl

and dl,0fh

add dl,30h

cmp dl,39h

jbe dispskip1

add dl,07h

dispskip1:

mov [edi],dl

inc edi

loop dispup1

scall 1,1,temp,2

ret

