#include<stdio.h>

#include<conio.h>

#include<math.h>

#define pi 3.14159265

void main()

{

double Sup,Np,Y1p,Zp,Q,Fw,Tbg,Sug,Ng,V,P,Tn,Bp,C,Tbp,g,Zg,x,val,re,Z1p,Z1g,Y1g,a,b,c,Fb,Dp,BHN,K,e,Ft,Kv;

clrscr();

printf("----------------Beam Strength-------------------- \n ");

printf("enter the value of Sup");

scanf("%lf",&Sup);

printf("enter the value of Sug");

scanf("%lf",&Sug);

printf("enter the value of Np");

scanf("%lf",&Np);

printf("enter the value of Ng");

scanf("%lf",&Ng);

Tbp=Sup/3;

Tbg=Sug/3;

printf("%lf N/mm2\n",Tbp);

printf("%lf N/mm2\n",Tbg);

g=Np/Ng;

Zg=g\*21;

printf("%lf\n",Zg);

printf("enter the value of x");

scanf("%lf",&x);

val=pi/180;

re=cos(x\*val);

printf("the value %lf\n ",val);

printf("the cos %lf ",re);

printf("enter the value of Zp");

scanf("%lf",&Zp);

Z1p=Zp/(re\*re\*re);

printf("the Z1p %lf \n",Z1p);

Z1g=Zg/(re\*re\*re);

printf("the Z1g %lf\n ",Z1p);

Y1p=0.484-(2.87/Z1p);

printf("the Y1p %lf\n ",Y1p);

Y1g=0.484-(2.87/Z1g);

printf("the Y1g %lf\n ",Y1g);

a=Tbg\*Y1g;

c=Tbp\*Y1p;

if(a<c)

{printf("gear is weaker \n");

printf("enter the value of b");

scanf("%lf",&b);

Fb=Tbg\*b\*Y1g;

printf("%lf Mn2 N\n",Fb);

}

else

{printf("pinion is weaker");}

printf("--------------------Wear Strength---------------------\n");

Dp=Zp/re;

printf("Dp is: %lfMn \n",Dp);

Q=2\*Zg/(Zg+Zp);

printf("Q is: %lf \n",Q);

printf("Enter the value of BHN");

scanf("%lf",&BHN);

e=BHN/100;

K=0.16\*e\*e;

printf("K is: %lf N/mm2 \n",K);

Fw=(Dp\*b\*Q\*K)/(re\*re);

printf("Fw is: %lf Mn2,N \n",Fw);

if(Fw<Fb)

{printf("Gear pair is weaker in pitting\n");

}

else

{printf("pinion pair is weaker in pitting\n");

}

printf("--------------------Effective Load---------------------\n");

V=(pi\*Dp\*Np)/60000;

printf("V is: %lf Mn,m/s \n",V);

printf("Enter the value of P");

scanf("%lf",&P);

Ft=P/V;

printf("Ft is: %lf/Mn,N \n",Ft);

Kv=5.6/(5.6+sqrt(V));

printf("Kv is: %lf/sqrt(Mn) \n",Kv);

getch();

}