Discussion on Results:

- There is slight increase in efficiency of combine cycle with increase in sfc for any particular value of mass flow rate of ABC as well as turbine inlet temperature of topping cycle of ABC weathered the number of intercooler is one, two and none.

- For any particular number of intercooler used and for any particular value of mass flow rate of ABC, the efficiency of combined cycle increases at the particular value of sfc.

- The sfc decreases as the number of intercooler increases for any particular value of mass flow rate of ABC , turbine inlet temperature and pressure ratio of topping cycle.

- The value of sfc also decreases with decrease in effectiveness of heat exchanger keeping the parameter like mass flow rate of ABC, turbine inlet temperature (t3t), number of intercooler and pressure ratio of topping cycle remain same.

CHAPTER 6.

CONCLUSION.

- A combined system with Air Bottoming Cycle can improve the gas turbine engine power and efficiency by about 22% and 18% respectively.

- An optimum point for such a system is found to be, the pressure ratio of 4 of air bottoming cycle with two intercoolers at turbine inlet temperature to topping cycle at 1300k.

- The use of inter cooling considerable improve the performance of ABC increasing bottoming cycle power output by by 7% in the relation to the non intercoled case. Nevertheless, the introduction of more then two intercoolers does not seem to be justified.

- A combined cycle is very much less costly then the using steam by dispensing with boiler, steam turbine, condensers, pumps, water treatment plants cooling towers etc and needed human resources.

- ABC is economical alternative generation for power generation on both new platforms and on existing platforms with demand for more power.

- A remunerator is recommended instead of a regenerator for the heat transfer for the gas turbine exhaust gas to the compressed gas of ABC.

cogeneration plant that provide clean hot air for process needs

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- This combined plant can be used as combined heat and power plant (CHP) ie cogeneration plant that provide clean hot air for process needs

```
# include<stdio.h>
# include<math.h>
# include<conio.h>

main()

{
clrscr();
float t3b=0,k=0,t2b=0,t4b=0,t4t=0;
int t3t=1000,n=0,mab=52,rp1=0,t1b=298;
float t1t=298,t2t=0,wct=0,wtt=0,wnet=0,wnett=0,wnetb=0,q=0,wcb=0,wtb=0;
float a=0.285,b=0.248,e=0.90,nt=0.92,nc=0.91,ncomb=0.90;
float mg=70.32,cpg=1.14,ma=69,cpa=1.005;
float neta_t=0, neta_net=0,rp2=0;
float alpha, beta=0.05,etot=0,sfc=0,mf=1.32,z=0;
printf
("\ne\tt3t\tmab\twnett\tq\tneta_t\tn\trp1\trp2\tt3b\twnetb\twnet\tneta_net\tsfc");
        for (z=0;z<=2;z++)
        { if (z==0)
          e=0.90;
          if (z==1)
          e=0.80;
          if (z==2)
          e=0.70;
        for (t3t=1000;t3t<=1400;t3t=t3t+100)
        for (mab=52;mab<=72;mab=mab+5)
        for (n=0;n<=2;n++)
        {
        printf ("\n");

        for (rp1=4; rp1<=13; rp1=rp1+2)
   {
        t2t=t1t*((1+((pow(rp1,a))-1)/nc));
        t4t=t3t*(1-(nt*(1-(pow(rp1,-b)))));
        t3b=t4t;
        wct= ma*cpa*(t2t-t1t);
        wtt= mg*cpg*(t3t-t4t);
        q=(1/ncomb)*((mg*cpg*t3t)-(ma*cpa*t2t));
        wnett=wtt-wct;
        alpha = ((1-e)*(1-(1/nc))*t1b)+((e*t3t)*((1-(nt*(1-(pow(rp1,-b)))))));
        k=(mg*cpg*b*nt*nc)/(mab*cpa*t1b*a);
        beta = ((1-e)*(t1b*(pow(k,(a/(a+b*(n+1)))))))/nc;
        rp2=(pow(k,(1/(a+b))))*(pow(t3b,(1/(a+b))));
        t2b =t1b*(1+(((pow(rp2,(a/(n+1))))-1)/nc));
        //t3b=alpha+(beta*(pow(t3b,(a/(a+b)))));
        t3b=alpha+(beta*(pow(t3b,(a/((n+1)*(a+b))))));
        t4b=t3b*(1-(nt*(1-(pow(rp2,-a)))));
        wcb=mab*cpa*(t2b-t1b);
        wtb=mab*cpa*(t3b-t4b);
        wnetb=wtb-wcb;
        wnet=wnett+wnetb;
        etot=wnet/q;
        sfc=(mf/wnet)*3600;
        neta_t=(wnett/q)*100;
        neta_net=(wnet/q)*100;
  //    printf ("\n%f",rp2);
        printf
("\n%3.2f\t%d\t%d\t%3.0f\t%3.0f\t%3.2f\t%d\t%d\t%3.2f\t%3.0f\t%3.0f\t%3.0f\t%3.2f\t%
3.2f\t",e,t3t,mab,wnett,q,neta_t,n,rp1,rp2,t3b,wnetb,wnet,neta_net,sfc);
      }
      getch();
  }
  getch();
```

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