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**ROLL NO.-81**

AIM:-TO PLOT PLANCK’S LAW AND THEN ESTABLISH STEFAN’S LAW

SOURCE CODE:-

**clc**

**clear**

**clf**

**n=0:(20e10):15\*(10^14)**

**h=6.624e-34;k=1.38e-23;c=3e8**

**T=500:100:1000**

**T0=1000**

**A=(8\*3.14\*h/(c^3))**

**for j=1:length(T)**

**for i=1:length(n)**

**up(j,i)=(A\*(n(i)^3))/(exp(h\*n(i)/(k\*T(j))-1))**

**ur(j,i)=(8\*3.14\*k\*T(j)\*(n(i)^2))./(c^3)**

**uw(j,i)=A\*(exp(-h\*n(i)/(k\*T(j))))\*(n(i)^3)**

**end**

**[p,q]=max(up(j,:))**

**Wm(j)=c/n(q)**

**U(j)=(20e10)\*sum(up(j,:))**

**end**

**subplot(2,1,1)**

**plot(n',up','linewidth',3);legend('T='+string(T)+'K')**

**title('Planck Law','fontsize',4)**

**xlabel("Wavelength(m)","fontsize",4)**

**ylabel("Energy density","fontsize",4)**

**subplot(3,1,2)**

**subplot(2,1,2)**

**T4=T.^4; E=U.\*(c/4)**

**plot(T4',E,"linewidth",3);title("Stefan Law","fontsize",4)**

**xlabel("T^4","fontsize",4)**

**ylabel("Intensity","fontsize",4)**

OUTPUT:

