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Course:B.Sc(H) Physics Sem 5

Roll No.-81

SOURCE CODE:

clear;

clc;clf;

function dx=f(r, x, E)

e=3.795; m=0.511\*10^6; h=1973

dx(1)=x(2)

dx(2)=((2\*m)/(h\*h))\*(-((e\*e)/r)-E)\*x(1)

endfunction

E1=input("Enter guess 1 for energy:");

E2=input("Enter guess 2 for energy:");

for i=1:100

r=0.01:0.01:8

u1=ode([0.01;1],0.01,r,list(f,E1));

u2=ode([0.01;1],0.01,r,list(f,E2));

E3=(E1+E2)/2

u3=ode([0.01;1],0.01,r,list(f,E3));

if(u1(1,800)\*u3(1,800))<0 then

E2=E3

else

E1=E3

end

end

disp(E3,"The energy eigen value (eV) for iteration is:" )

a=gca()

a.x\_location="origin"

a.y\_location="origin"

plot(r,u3(1,:));

xlabel('r',"fontsize",4);ylabel('u(r)',"fontsize",4)

title(" Cuve for solution of s-wave Scrodinger wave equation for the ground state of the H atom ","fontsize",2)

OUTPUT:

Enter guess 1 for energy:-10

Enter guess 2 for energy:-14

The energy eigen value (eV) for iteration

is:

-13.595599

