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**Course-B.Sc(H) Physics, Sem 5**

**Roll No.-081**

**TO FIND ENERGY EIGENVALUES OF SCHRODINGER EQUATION**

SOURCE CODE:

clc;

clear;

clf;

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

n=input("Enter n: ")

A=eye(n,n)

A=A\*(-2)

for i=1:n-1

A(i+1,i)=1

A(i,i+1)=1

end

r=linspace(1D-8,30,n)

V=zeros(n,n)

for i=1:n

V(i,i)=(-(e^2)/r(i))

end

k=(30-(1D-8))/n

disp(k)

B=(-(h^2)/(2\*m\*k^2))\*A+V

[u,E]=spec(B)

disp(E(1,1),"Ground state energy:")

disp(E(2,2),"1st Excited state energy:")

disp(E(3,3),"2nd excited state energy:")

disp(E(4,4),"3rd excited state energy:")

OUTPUT:

Enter n: 1000

Enter range: 30

Ground state energy:

-13.57583

1st Excited state energy:

-3.3959992

2nd excited state energy:

-1.5095013

3rd excited state energy:

-0.8489741