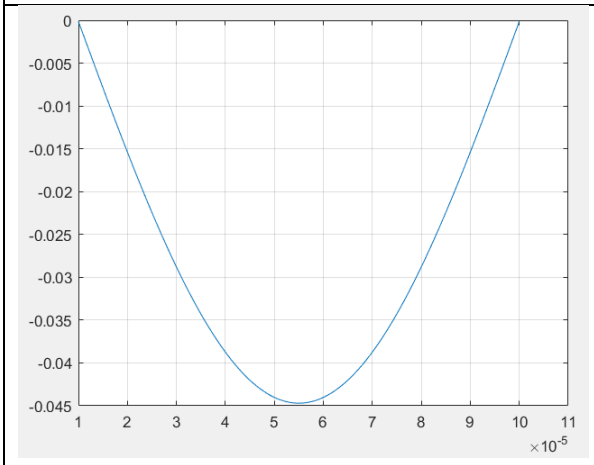
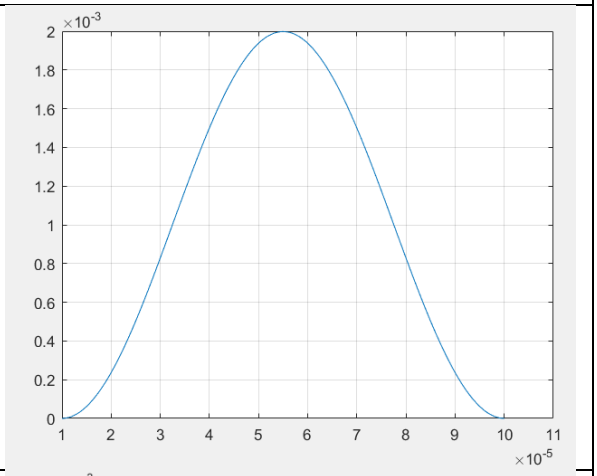
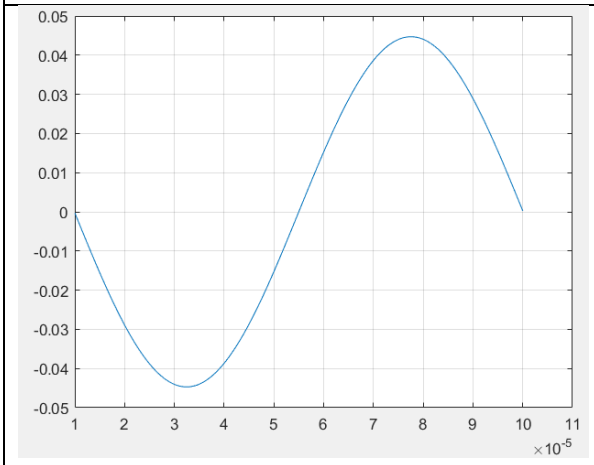
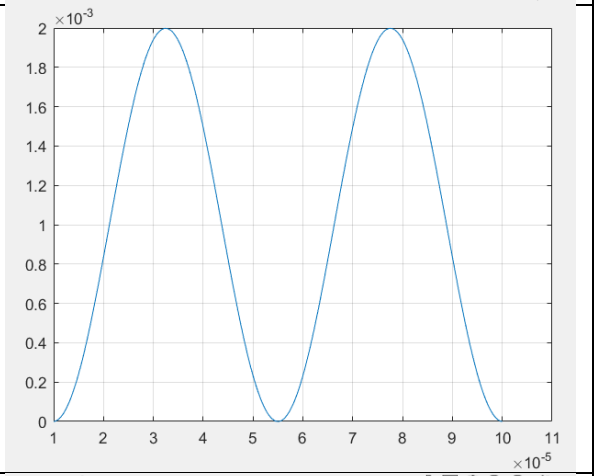
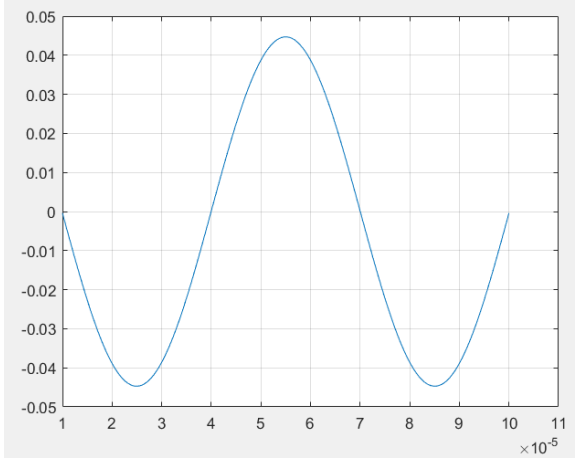
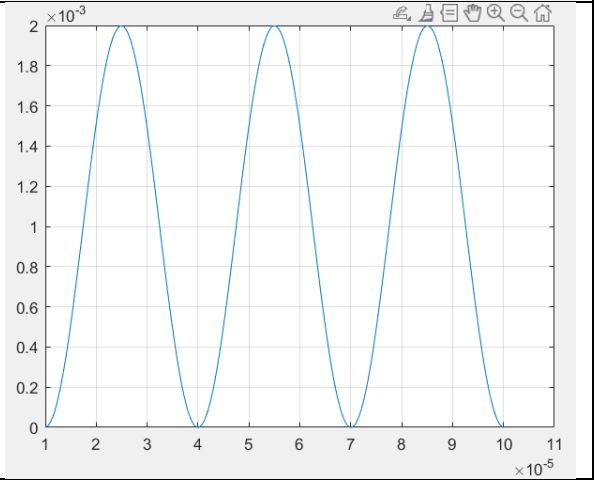
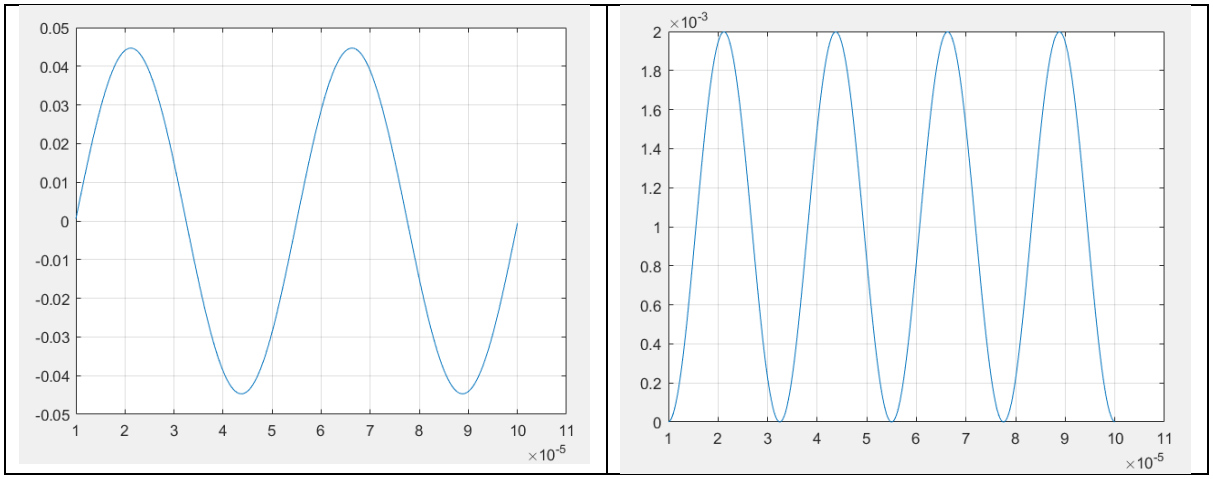
Task-1: Infinite potential Well

Matlab Code:

```
clc;
clear all;
close all;

%% Constants
n=1000;
xmin=1e-5;
xmax=1e-4;
x=linspace(xmin,xmax,n);
a=x(1)-x(2);

t0=(6.582119569e-16)^2/(2*9.11e-31*a^2);

%% eigen value and eigen vector finding
V=zeros(n,n);

K=eye(n)*2*t0;
for i=1:n-1
   K(i,i+1)=-t0;
   K(i+1,i)=-t0;
end

H=V+K;
[V1,d]=eig(H);

eigenvalue=diag(d);

%% Plots
for i=1:4
   psi=(real(V1(:,i)));
   figure
   plot(x,psi)
   grid on
end

for i=1:4
   psi=(abs(V1(:,i))).^2;
   figure
   plot(x,psi)
   grid on
end
```

Plots

Psi	|Psi|^2
	
	
	


0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
-0.03
-0.04
-0.05
1
2
3
4
5
6
7
8
9
10
11
×10-5
×10-3
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
8
9
10
11
×10-5