

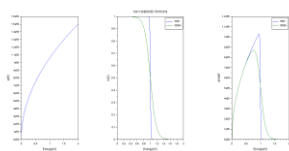
Program – 7a

```
clc
clear
clf
//for non relativistic fermions
e=1.6e-19
kb=1.38e-23
h=6.626e-34
s=0.5
c=3*10^8
u=1
v=1
m=9.1e-31
E=0:0.001:2
T=[100 1000]
c1=(2*s+1)*(2*3.14*v*(2*m)^1.5)/(h^3)
for j=1:length(T)
    b=1/(kb*T(j))
    for i=1:length(E)
        g(i)=c1*(E(i))^0.5
        n(j,i)=1/(exp((E(i)-u)*e*b)+1)
        f(j,i)=g(i)*n(j,i)
    end
end
subplot(1,3,1)
plot(E,g)
ylabel('g(E)')
xlabel('Energy(eV)')

subplot(1,3,2)
plot(E,n)
legend(string(T)+'K')
ylabel('n(E)')
xlabel('Energy(eV)')
title('non relativistic fermions')

subplot(1,3,3)
plot(E,f)
legend(string(T)+'K')
ylabel('dN/dE')
xlabel('Energy(eV)')
```

output



PROGRAM – 7b

```

clc
clear
clf
//for non relativistic bosons
e=1.6e-19
kb=1.38e-23
h=6.626e-34
s=1
c=3*10^8
u=-1
v=1
m=4*1.66e-27
E=0:0.001:0.5
T=[100 1000]
c1=(2*s+1)*(2*3.14*v*(2*m)^1.5)/(h^3)

```

```

for j=1:length(T)
    b=1/(kb*T(j))
    for i=1:length(E)
        g(i)=c1*(E(i))^0.5
        n(j,i)=1/(exp((E(i)-u)*e*b)-1)
        f(j,i)=g(i)*n(j,i)
    end

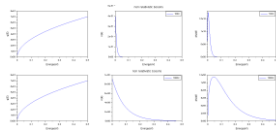
    subplot(2,3,j*j)
    plot(E,g,'linewidth',4)
    ylabel('g(E)')
    xlabel('Energy(eV)')

    subplot(2,3,j*j+1)
    plot(E,n(j,:), 'linewidth',4)
    legend(string(T(j))+ 'K')
    ylabel('n(E)')
    xlabel('Energy(eV)')
    title('non relativistic bosons')

    subplot(2,3,j*j+2)
    plot(E,f(j,:), 'linewidth',4)
    legend(string(T(j))+ 'K')
    ylabel('dN/dE')
    xlabel('Energy(eV)')
end

```

output



PROGRAM - 3c

```

clc
clear
clf
//for relativistic fermions
e=1.6e-19
kb=1.38e-23
h=6.626e-34
s=0.5
c=3*10^8
u=1
v=1
E=0:0.001:2// in Mev
T=[10^8 10^9]
c1=(2*s*4*3.14*v)/((h^3)*(c^3))
for j=1:length(T)
    b=1/(kb*T(j))
    for i=1:length(E)
        g(i)=c1*(E(i))^2
        n(j,i)=1/(exp((E(i)-u)*10^6*e*b)+1)
        f(j,i)=g(i)*n(j,i)
    end
end

```

```

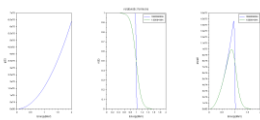
end
subplot(1,3,1)
plot(E,g)
ylabel('g(E)')
xlabel('Energy(MeV)')

subplot(1,3,2)
plot(E,n')
legend(string(T)+'K')
ylabel('n(E)')
xlabel('Energy(MeV)')
title('relativistic fermions')

subplot(1,3,3)
plot(E,f')
legend(string(T)+'K')
ylabel('dN/dE')
xlabel('Energy(MeV)')

```

OUTPUT



Program – 7d

```
clc
clear
clf
//for relativistic bosons
e=1.6e-19
kb=1.38e-23
h=6.626e-34
s=1
c=3*10^8
u=-1
v=1
E=0:0.001:6 //in Mev
T=[10^9 10^10]
c1=(2*s*4*3.14*v)/((h^3)*(c^3))
for j=1:length(T)
    b=1/(kb*T(j))
    for i=1:length(E)
        g(i)=c1*(E(i))^2
        n(j,i)=1/(exp((E(i)-u)*10^6*e*b)-1)
        f(j,i)=g(i)*n(j,i)
    end

    subplot(2,3,j*j)
    plot(E,g,'linewidth',4)
    ylabel('g(E)')
    xlabel('Energy(MeV)')

    subplot(2,3,j*j+1)
    plot(E,n(j,:), 'linewidth',4)
    legend(string(T(j))+ 'K')
    ylabel('n(E)')
    xlabel('Energy(MeV)')
    title(' relativistic bosons')

    subplot(2,3,j*j+2)
    plot(E,f(j,:), 'linewidth',4)
    legend(string(T(j))+ 'K')
    ylabel('dN/dE')
    xlabel('Energy(MeV)')
end
```

OUTPUT

