

CEE 3804 – Computer Applications in CEE

Assignment 8 Solution

Problem 1

a)

```
function Jxx = Jxx_Function(h,m,R)

Jxx = m*(h^2/12+R^2/4);

function Jyy = Jyy_Function(h,m,R)

Jyy = m/12*(4*h^2+3*R^2);
```

b)

```
clear
clc
%Problem 1 a,b
m = 250;
h = 0.5;
R = 1;

JxxValue = Jxx_Function(h,m,R);
disp(['The value of Jxx is ',num2str(JxxValue)]);

JyyValue = Jyy_Function(h,m,R);
disp(['The value of Jyy is ',num2str(JyyValue)]);
```

```
The value of Jxx is 67.7083
```

```
The value of Jyy is 83.3333
```

c)

```
function Jxx = Jxx_FunctionC(h,mC,R)

Jxx = mC.*(h^2/12+R^2/4);
```

```
function Jyy = Jyy_FunctionC(h,mC,R)
```

```
Jyy = mC./12*(4*h^2+3*R^2);
```

```
%Problem 1 c
```

```
mC = 200:1:400;
```

```
JxxValueC = Jxx_FunctionC(h,mC,R);
```

```
JyyValueC = Jyy_FunctionC(h,mC,R);
```

Problem 2

a)

```
function dTdt = Temperature(K,T,Ta,m)
```

```
dTdt = -K*(T-Ta).^m;
```

b)

```
K = 0.043;
```

```
m = 2.1;
```

```
Ta = 15;
```

```
T = linspace(50,200,100);
```

```
dT_dtValue = Temperature(K,T,Ta,m);
```

c)

```
%Problem 2 c
```

```
plot(dT_dtValue,T)
```

```
xlabel('Asphalt mix Temperature(deg.C)')
```

```
ylabel('Rate of Change of Asphalt')
```

```
title('Rate of Change of asphalt temperature with asphalt temperature')
```

