Assignment 2

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Roll no- 230750

Matlab code –

```
clc,clear,close all
% dimensions of cylinder
r2 =  linspace(.1,1,50);      %inner radius r1 of cylinder in meter
r1 = 0.05;                     % outer radius of insulation in meter
L = 1;                         % length of cylinder in meter
k = 10;                        %conductivity of insulating material
h = 40;                        % convective heat transfer coefficient of air
rc = k/h;                       % critical radius at which total resistance is
miniumum
fprintf('critical radius of insulation :%0.02f',rc);
Ts = 40 ;                      %surface temperature of cylinder
Tinf = 20;                     % temperature of surrounding
A1 = 2*pi*r1*L;                % surface area of cylinder
A2 = 2*pi*r2*L;                %outer surface area of insulated cylinder
Q_dot = (Ts-Tinf)./((log(r2./r1))./(2*pi*k*L) + 1./(h*A2));%heat transfer through
cylinder at different r1
plot(r2,Q_dot,'r-o','LineWidth',1.5);
xlabel(' r1 (radius of cylinder(in m))');
ylabel('Q\_dot (rate of heat transfer(W)')
title('plot of Q\_dot vs radius of cylinder')
```

plot obtained-