## EXERCISE 1:

When heat transfer happens between a surface and a fluid ,both having different temperatures is known as convection.This happens through the movement of molecules.The diffusion is higher at the surface than at a distance from the surface due to the density of the fluid.
Convective heat transfer is of two types namely Forced convection and natural convection.
NATURAL CONVECTION: Natural convection occurs due to the change in density of the fluid. For example when a heated surface is kept in contact with air, the surrounding air gets heated due to the bulk transfer of molecules. This heated air is lighter than room temperature air causing it to rise above the denser air. This sets forth a natural flow. This is also known as Newtons Law of Cooling.

FORCED CONVECTION: Forced convection occurs when there is an external influence using the flow of molecules. An example would be a fan.

Increasing the thickness of the glass doesn't matter because an increase in the thickness will increase the conductive resistance of the glass. However this resistance is not significant while compared to other factors. Though increasing the thickness of the glass makes a sight change in the resistance it is not as effective as the air gap.

## EXERCISE 2: No mistakes. Only the rounding off numbers were different

## EXERCISE 3:

Given,
Length=1.5m
H=0.8m
L1=0.006m
L2=0.013m
k1=0.78 W/m°C
k2=0.026 W/m°C

$$^{o}Q=\frac{T_{\infty 1}-T_{\infty 2}}{R_{total}}$$

$$R_{total}=R_{Conv1}+R_{Wall1}+R_{Wall2}+R_{Wall3}+R_{Conv2}$$

$$R_{Conv1}=0.0833$$

$R_{Wall1} = 0.00641$

$R_{Wall2} = 0.4166$

$R_{Wall3} = 0.00641$

$R_{Conv2} = 0.0208$

Therefore,

$R_{total} = 0.53352\ °C/W$

$$^{o}Q = \frac{T_{\infty 1} - T_{\infty 2}}{R_{total}} = 56.2303\ W$$

Now, the temperature of inner surface can be found by using,

$$^{o}Q = \frac{T_{\infty 1} - T_1}{R_{Conv1}}$$

$T_1 = 15.3160°C$

The rate of convective heat transfer is lower when compared to the previous example.