**Weekly Assignment**

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**Week : 1**

**Example 1:**

Given:

L=0.4m, A=20m2, DeltaT=25 and k=0.78 W/m

**Solution 1 (Simple Method):**

Q.=kA DeltaT/L = 0.78x20 (25/0.4) = 975 W

**Solution 2 (Resistance Method):**

Rwall= L/kA = 0.4/0.78x20 = 1/39 equivalent to 0.025641

Q.= DeltaT/Rwall = 25/0.025641 =975 W

**Short Summary of Conduction:**

Conduction is the state or the process where heat or electricity passes through a material when there is a difference of temperature or difference in electrical potential between two regions in a specific direction so usually walls in houses as such are estimated or seen as steady where steady means that there is no change in temperature and that it is usually constant. Therefore the rate of heat transfer is constant in steady state. In the Steady state, heat moves in one direction which is through the wall which is usually considered as X or the x-direction.

Rate of heat conduction increases as the thickness of the wall decreases and Vice versa, the thicker the wall the smaller the rate will be. But, rate of heat conduction is proportional to temperature difference, wall area and conductivity.

There are two ways to calculate the rate of heat conduction either by Fourier’s Law or by the Thermal Resistance concept. Thermal resistance is a heat property where a certain material resists the heat to flow through it. It is also a measurement of a temperature difference. Thermal resistance is basically the reciprocal of thermal conductance.

There are 3 important rules to use in order to calculate the rate of heat transfer:

Q.= kA DeltaT/L where DeltaT is difference between Tin and Tout and L is the thickness of the wall

Q. = DeltaT/Rwall where Rwall is resistance of Wall

Rwall= L/kA