Assignment 1

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Question: A short summary about the conductive heat transfer and solving the same exercise with L= 0.4 m, A= 20 m2, DeltaT= 25, and k=0.78 W/m K using both simple method and using the resistance concept

Summary:

Conduction is the transfer of heat between two solid bodies that are in direct contact with each other. The better the conductor, the more rapidly heat will be transferred. Conduction occurs when a substance is heated; particles will gain more energy and vibrate then collide into nearby particles and transfer some of their energy to them. This then continues and passes the energy from the hot end down to the colder end of the substance.

The process of heat conduction depends on four basic factors: the temperature gradient, the cross section of the materials involved, their path length, and the properties of those materials.

Using the simple method:

Q = $KA\frac{\Delta T}{L}$ = 0.78 x 20 x $\frac{25}{0.3}$ = 975 w

Using the resistance concept:

Rwall = $\frac{L}{KA}$ = $\frac{0.4}{0.78X20}$ = 0.02564 K/w

Q= $\frac{\Delta T}{Rwall}$ = $\frac{25}{0.02564}$ = 975 w