1. Consider the thermal composite composed of two kinds of conductors, $K_{f1}=100\text{W/(Km)}$ and $K_{f2}=50\text{W/(Km)}$, and one insulator, $K_m=0.2\text{W/(Km)}$, see the following figure. Under applied heat at the top, $Q=100\text{W}$, we would like to calculate the temperature at top, $T_1$, and the temperature at mid-points, $T_2-T_4$, where the temperature at the bottom, $T_5$ is set to $T_5=0$. Answer the following questions. Please note that you do not need to solve for all unknowns.

(a) Calculate all thermal resistances, $R_{ij}$ defined in the figure, assuming the thickness perpendicular to this paper sheet is $1\text{mm}$.

(b) Set the algebraic equations at nodal points (1-5) by using Kirchoff Current Law: all currents (or thermal flow in this problem) coming to the $i$-th nodal point if they are summed up, it is equal to zero.

(c) Solve for temperatures, $T_1$, $T_2$, $T_3$ and $T_4$