Week4_TNohra

Question 1:

Based on the previous week calculation:
Rw=1.109 and Ri=4.007

- Uw= 1/R'w = 1/1.109 =0.9017 w/m2C
- Ui= 1/Ri = 1/4.007=0.2496 w/m2C
- Utot=Uw * (Aw/Atot) + Ui * (Ai/Atot)
  = 25% * 0.9017 +75% * 0.2496
  = 0.4126 w/m2C
- Rvalue =1/Utot = 1/ 0.4126 = 2.423 m2C/W
- Qtot= Utot * Atot * T
  = 0.4126 * 50 * 2.5 * (1-20%) * (22+2)
  = 990.24 W

Question 2:

The term of radiation heat transfer refers to the transfer of heat, also known as energy, through the emission of electromagnetic waves such as light, UV, microwaves … This process can happen through gases, liquids and also solids, and doesn't need any real physical contact between the source of the heat or the radiation and the new object that is receiving the heat. We can note that the radiation is a moving magnetic field.

$\lambda = c/v$ with λ being the wave length and v the frequency.
therefore, we note that the wave length and the frequency are proportional.

The radiation coming from a source, propagates in all directions.

The electromagnetic spectrum is very wide, but only a very rage of it is visible to the naked human eye. We see it as different colors, depending on its wavelength range. Therefore, we can notice that each color has a different wavelength than the others.

A black body, is a perfect model, used to set radiative properties of other surfaces because it is a perfect emitter and absorber since it absorbs all the radiation it receives and emits it back. In other words, a black body, emits the maximum possible radiation to all wave lengths and absorbs all the radiation that is propagating towards it.

$$E_{b\lambda}(\lambda, T) = \frac{C_1}{\lambda^5[\exp(C_2/\lambda T) - 1]} \qquad (\mathrm{W/m^2 \cdot \mu m})$$

From that we notice that every time the temperature increases, the amount of emitting radiation will also increase.

The emissive body, represented by E, exponentially increases with the temperature T.