Task 1

$Utot = Uwood*Awood/\ Atot+Uins*Ains/\ Atot$

=1/Rwood*0.25+1/Rins*.75=1/1.109*0.25+1/4.007*0.75

=250/1109+750/4007=0.225+0.187=0.412

$Utot$ = 0.412

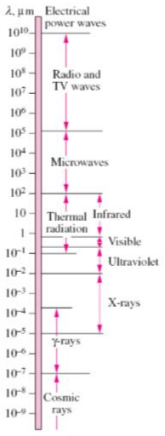
Qtot=0.412/1000*100*2.4=412*2.4=988.8

Qtot=988.8

Task 2

Heat transfer from a body with a high temperature to a body with a lower temperature, when bodies are not in direct physical contact with each other or when they are separated in space, is called heat radiation, as schematically shown in. All physical substances in solid, liquid, or gaseous states can emit energy via a process of electromagnetic radiation because of vibrational and rotational movement of their molecules and atoms. The intensity of such energy flux depends upon the temperature of the body and the nature of its surface. The radiation occurs at all temperatures, with the rate of emission increasing with the temperature.

RADIATION: conduction and convection require matter to transfer heat. Radiation is a heat transfer that doesn't need matters between object to transfer heat. Radiation is a form of energy transport made of electromagnetic waves traveling at the speed of light.



The electromagnetic wave spectrum.

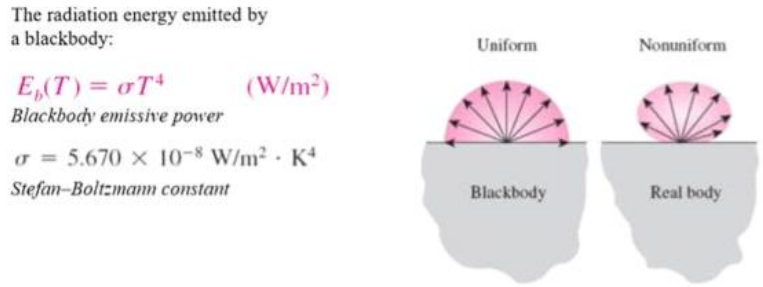
A real world example of radiation includes the sun as the main example, which emits heat through radiation that eventually reaches us to Earth with a lower intensity due to the protective shield around the Earth, known as the ozone layer. Other examples would be the heat radiators we use during winter to keep ourselves warm. Other forms of radiation which come in waves include radio waves, visible light which we see through colors in our world, microwaves (how we heat our food in a quick manner) ultraviolet (commonly used in beauty salons for long lasting nail polish), x-rays (used in hospitals to see our bone structure through our skin and…

Electromagnetic radiation is called that because wave electromagnetic radiant energy. It includes all kind of waves from visible to invisible.

Electromagnetic waves have direct relation with speed of light and uposite relation with wave frequency.

λ= c/v

Blackbody is a surface that can take all radiation energy from any direction and it doesn't deepen on wavelength too.



Black body: Heat transfer through radiation takes place in form of electromagnetic waves mainly in the infrared region. Radiation emitted by a body is a consequence of thermal agitation of its composing molecules. Radiation heat transfer can be described by reference to the 'black body'.

Wien's law formula: This law states that the black body radiation curve for different temperatures peaks at a wavelength inversely proportional to the

temperature. Maximum wavelength = Wien's displacement constant / Temperature

The peak wavelength related to temperature T: the form of the law remains the same, the peak wavelength is inversely proportional to temperature, and the peak frequency is directly proportional to temperature.