

Question 1 : Write A Summary Of The Topics About The Definitions Of:

- a. **Incident Radiation:** it means the receiving radiation.
- b. **Radiosity:** it is the total energy transmitted/radiated from a surface per unit area per unit time, it is like the total reflected and emitted energy.
- c. **Irradiation:** it describes the received radiation from the emitting body.
- d. **Emissivity:** it is how much radiation I have with respect to a BlackBody that is between 0 and 1 since a Blackbody's emissivity is always 1.
- e. **Absorptivity:** it is the energy absorbed by the receiving body.
- f. **Reflectivity:** it is the energy reflected by the receiving body and it depends on the material of the body, usually it is easy to obtain, if you know how much energy is absorbed then the remaining is reflected because unless the material has transmissivity (if glass) then it goes through it and is equal to zero.
- g. **The view factor:** it is the radiation leaving once surface (I) and received by another surface (J)
- h. **The heat exchange between two black surfaces:** it is the heat exchange between two blackbodies without reflection due to the material.
- i. **The heat exchange between the two gray surfaces:** it is the heat exchange between two bodies that have reflective and emissive properties
- j. **The definition of radiative resistances:**

Question 2 : Radiative Heat Exchange Between Two Parallel Plates Where awhile considering the two emissivities to be 0.1 where:**Part I**

$$A = 1.5 \text{ m}^2 \quad \epsilon_1 = \epsilon_2 = 0.1$$

$$T_1 = 800 \text{ K} \quad T_2 = 500 \text{ K} \quad \sigma = 5.67 \times 10^{-8} \frac{\text{W}}{\text{m}^2 \text{ K}^4}$$

$$\dot{Q}_{1 \rightarrow 2} = \frac{1.5 \times 5.67 \times 10^{-8} \times (800^4 - 500^4)}{\left(\frac{1}{0.1} - \frac{1}{0.1} + 1\right)} = 1553.7 \text{ W}$$

Part II

$$F_{12} = 0.01$$

$$\begin{aligned} \dot{Q}_{1 \rightarrow 2} &= A_1 \times F_{12} \times \sigma (T_1^4 - T_2^4) = 1.5 \times 0.01 \times 5.67 \times 10^{-8} (800^4 - 500^4) \\ &= 29520.855 \text{ W} \end{aligned}$$

