QUANTUM MECHANICS

Block body: (definition)

A perfect black body is the one which absorbs 100% of the radiation incident upon it, and reradiates 100% radiation.

The radiation given out by a perfect black body is called **black body radiation.**

[**Stefan - Boltzmann Law**

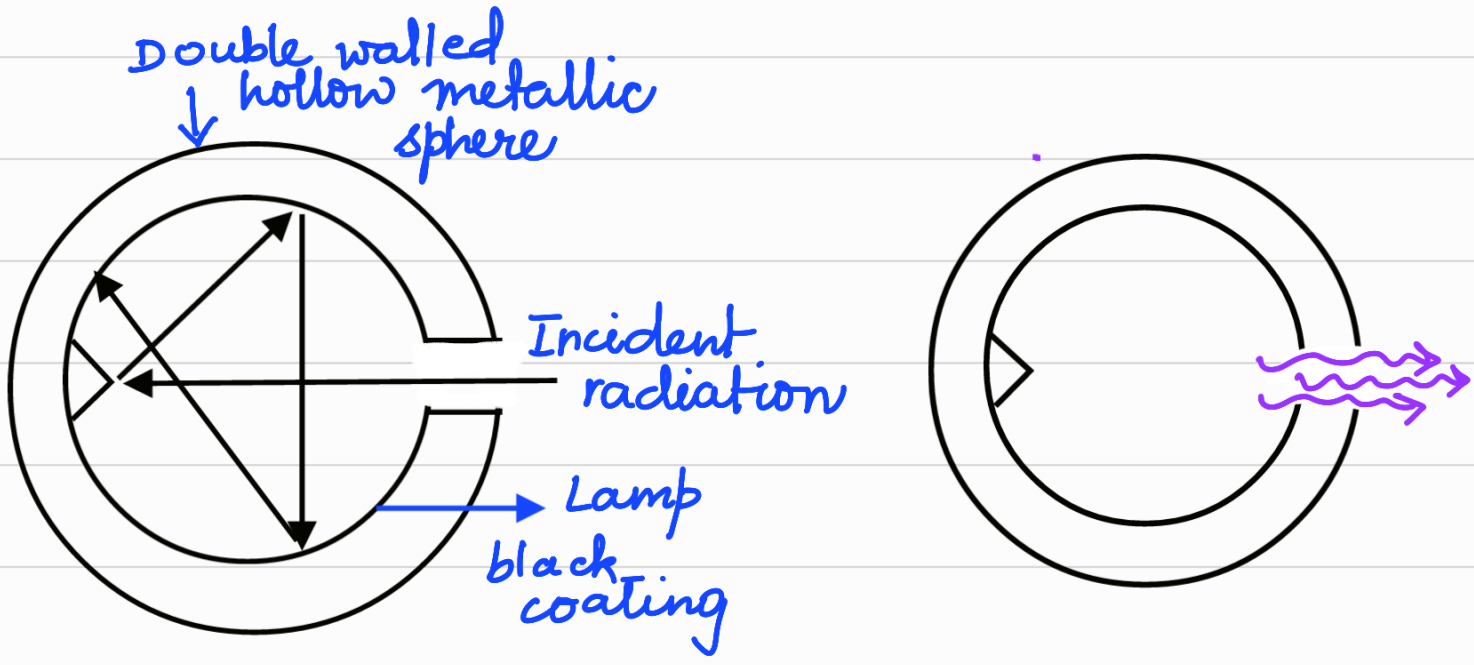
Energy emitted from a black body increases as the fourth power of its absolute temperature

$$E \propto T^4 \quad \text{or} \quad E = \sigma T^4$$

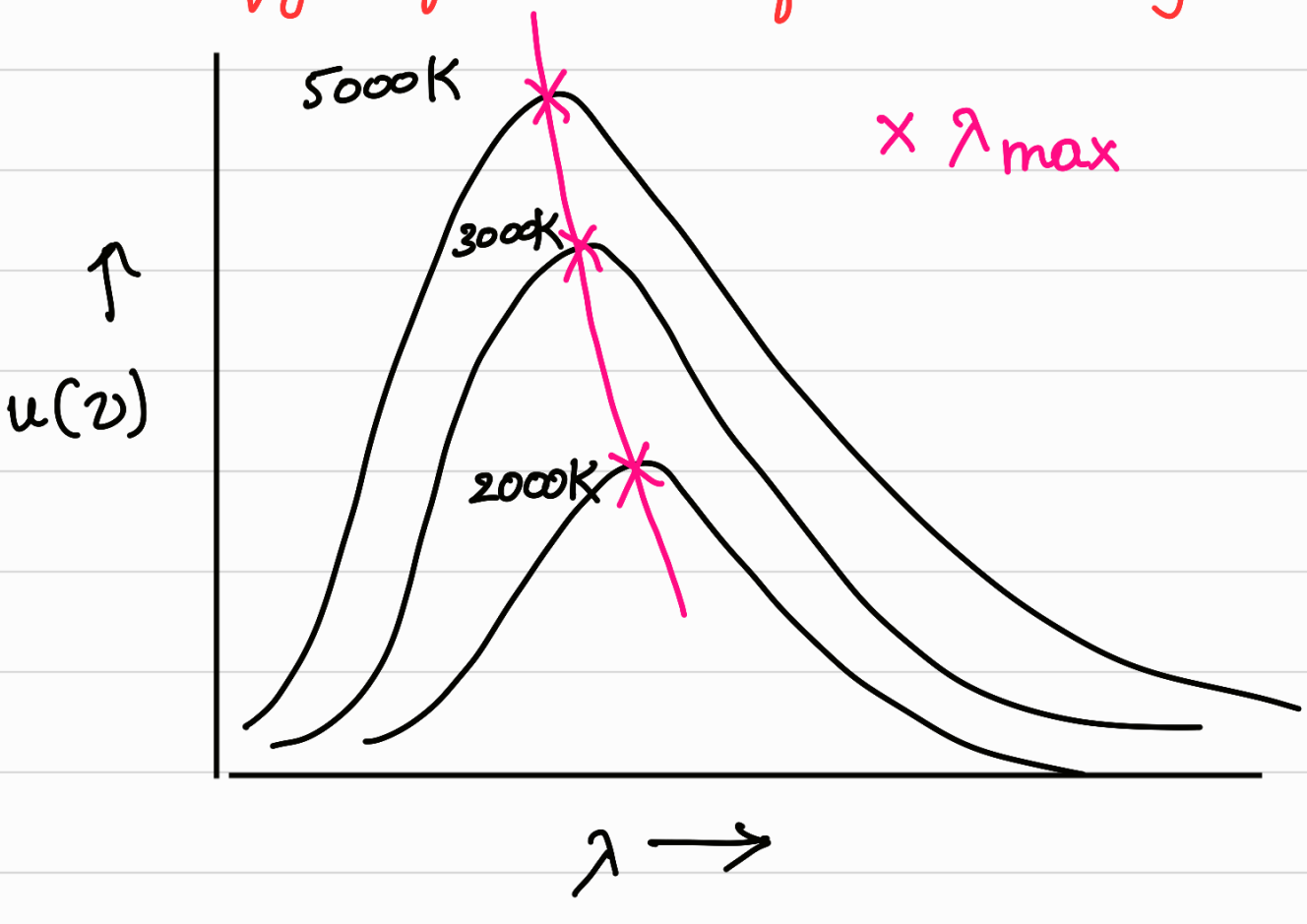
σ is Stefan Boltzmann constant

$$\sigma = \frac{2\pi^5}{15} \frac{k_B^4}{h^3 c^2} \;]$$

Diagram :



Energy Spectrum of black body



Characteristics

→ Energy distribution is non uniform.

→ The intensity $u(\nu)$ of black body radiation depends on the wavelength λ of the emitted radiation and on temperature T of blackbody.

$$\lambda_{max} \cdot T = 2.898 \times 10^{-3} \text{ mK}$$

↳ position of maximum.

→ As T increases, peak maximum shift towards lower wavelength.

→ Area under particular curve is total energy