

1. Evaluate how Planck's hypothesis of quantized energy change the understanding of electromagnetic radiation?

As per Planck's hypothesis of quantized energy, electromagnetic radiation is not continuous but comes in discrete packets called quanta (or photons).

The energy  $E$  of each quantum is proportional to the frequency  $\nu$  of the radiation.

This changed the understanding of quantization of Energy, resolution of Ultraviolet Catastrophe, and wave-particle duality foundations.

2. Find the average energy of an oscillator of frequency  $5 \times 10^{12}/s$  at 300 K treating the oscillator as Planck's oscillator.

$$\langle E \rangle = \frac{h\nu}{e^{h\nu/kT} - 1}$$