# Exemplar Problems

Q30. Wavelengths of different radiations are given below:

$$\lambda(A) = 300 \text{ nm}, \lambda(B) = 300 \text{ µm}, \lambda(C) = 3 \text{ nm}, \lambda(D) = 30 \text{ Å}$$

Arrange these radiations in the increasing order of their energies.

**Sol.** $E = h\nu \text{ or } = \dfrac{hc}{\lambda} \text{ or } E \propto \dfrac{1}{\lambda}$

$\lambda(A) = 300 \text{ nm} = 300 \times 10^{-9} \text{ m or} = 3 \times 10^{-7} \text{ m};$
$\lambda(B) = 300 \times 10^{-6} \text{ m} = 3 \times 10^{-4} \text{ m}$
$\lambda(C) = 3 \times 10^{-9} \text{ m}, \lambda(D) = 30 \times 10^{-10} \text{ m} = 3 \times 10^{-9} \text{ m}$
∴ Increasing order of energies is:
$\qquad B < A < C = D$