Q6: The work function of a substance is 4.0 eV. The longest wavelength of light that can cause photoelectron emission from this substance is approximately

(a) 540 nm

(b) 400 nm

(c) 310 nm

(d) 220 nm

Solution

Let λ_m = Longest wavelength of light

$(hc/\lambda_m) = \Phi$ (work function)

$\lambda_m = hc/\Phi = (6.63 \times 10^{-34}) \times (3 \times 10^8)/(4.0 \times 1.6 \times 10^{-19}) = 310$ nm

Answer: (c) 310 nm