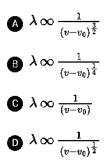
Previous Year JEE Problems with Explanations

The de Broglie wavelength (λ) associated with a photoelectron varies with the frequency (v) of the incident radiation as, [v₀ is threshold frequency] :



Explanation

By photoelectric effect

 $KE = h\gamma - h\gamma_0 \dots (1)$

de broglie wavelength,

$$\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2m \times K.E}} \dots (2)$$

Using equation (1) and (2), we get

$$\lambda = \frac{h}{\sqrt{2m \times (h\nu - h\nu_0)}}$$
$$\therefore \lambda \propto \frac{1}{(v - v_0)^{\frac{1}{2}}}$$