



VIVA - VOCE

Q.1. What is the aim of your experiment ?

Ans. To find the value of Planck's constant by photoelectric cell.

Q.2. What is photocell ?

Ans. A device which converts light energy into electrical energy. It consists of a photosensitive metal plate as cathode and other electrode as anode.

These are of two types (i) Vacuum type (ii) Gas filled type (gives more current than vacuum type).

Q.3. What is principle of photocell ?

Ans. It is based upon principle of photoelectric effect.

Q.4. What is photoelectric effect ?

Ans. The phenomenon of ejection of electrons from surface of metal when light radiation of suitable frequency is allowed to fall upon it.

Q.5. What is threshold frequency ?

Ans. The minimum frequency of incident radiation below which ejection of electrons does not take place.

Q.6. What material is used as photosensitive material in photo cell for visible light ?

Ans. All alkali metals are used as photosensitive material because their work function is very low.

Q.7. What is stopping or cut off potential ?

Ans. That value of negative potential applied to anode at which photoelectric current becomes zero is called stopping or cut off potential.

Q.8. What are laws of photoelectric emission ?

Ans.

- (i) The number of photoelectrons emitted depends upon intensity of incident radiation.
- (ii) There is a minimum value of frequency below which no emission of photoelectrons takes place, known as threshold frequency.
- (iii) The energy of photoelectrons emitted depends upon the frequency of incident radiations and is independent of intensity of incident light.
- (iv) The photoelectric emission is instantaneous.

Q.9. What is Einstein photoelectric equation ?

Ans. $h\nu = W + \frac{1}{2}mv^2$ or $h\nu = h\nu_0 + \frac{1}{2}mv^2$
 $h(\nu_1 - \nu_0) = \frac{1}{2}mv^2$ where ν_0 = threshold frequency

Q.10. 1 eV is equal to how much joule ?

Ans. $1 \text{ eV} = 1.6 \times 10^{-19} \text{ joule.}$

Q.11. With increase in wavelength of incident radiation, the energy of emission increases or decreases.

Ans. With increase in wavelength of incident radiation, the energy of emission decreases because, $E = \frac{hc}{\lambda}$ i.e. $E \propto \frac{1}{\lambda}$.

Q.12. How photo electric effect differ from thermionic emission ?

Ans. In photo electric effect the ejection of electrons from metal surface takes place when light radiation of suitable frequency are allowed to fall upon it. Whereas in thermionic emission ejection of electrons from metal surface takes place when it is suitably heated.

Q.13. What is photo electric work function ?

Ans. The minimum value of energy of incident radiation, which can eject photo electrons from metal surface without imparting if any velocity is called photo electric work function.

Q.14. With increase in frequency of incident radiation, the photoelectric current increases, or decreases?

Ans. It neither increase nor decreases but remains constant.

Q.15. Why photocell should be exposed to light for longer time ?

Ans. If it is exposed to light for longer time, the photo-sensitive part of photocell will not give uniform number of photo electrons.

Q.16. Why experiment should be performed in dark room ?

Ans. So that no extraneous light should not enter the photocell.

Q.17. Why large part of photo cathode should be exposed to light ?

Ans. This is to avoid the error due to different photo sensitive part of photocell.

Q.18. What determines the maximum velocity of photo electrons?

Ans. The frequency of incident radiations and work function of the metallic surface.

Q.19. What is rest mass of photon ?

Ans. Zero.

Q.20. Do non-metals show photo electric effect ?

Ans. Yes, they show photo electric effect with light of high frequency.

Q.21. What are the units of Planck's constant ?

Ans. Joule - sec.

Q.22. What is the value of Planck's constant ?

Ans. $6.625 \times 10^{-34} \text{ J-s.}$

Q.23. Give dimensional formula of Planck's constant ?

Ans. ML^2T^{-1} .

