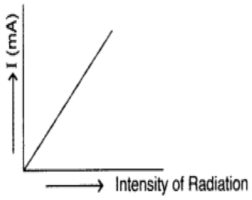
Directorate of Education, GNCT of Delhi

Suggestive Key Points

Practice paper 2;Term - 2 (2021-22)

Class – XII

Physics (Code: 042)

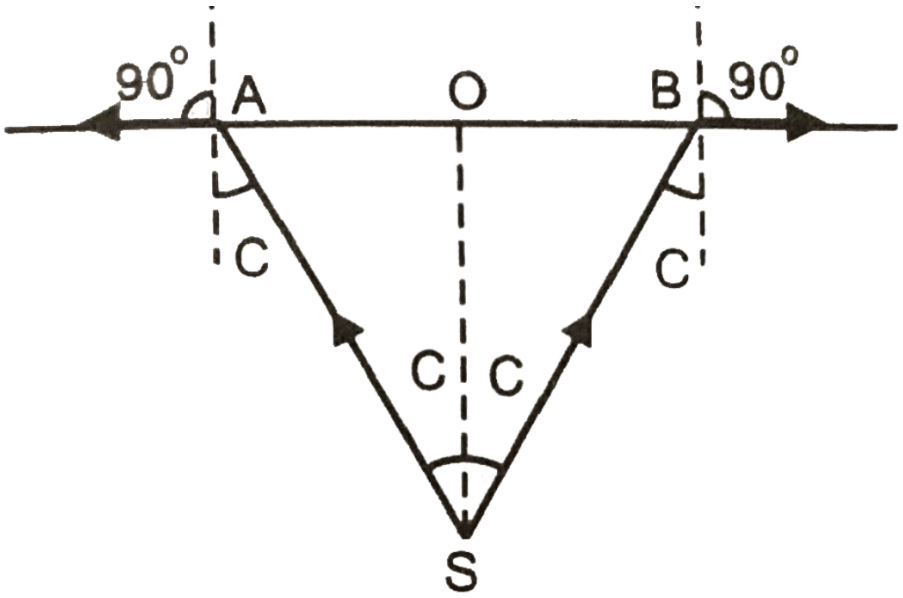
Q.No.	Suggestive Key points
1	a)  b) Metal 'A', because of the higher threshold frequency for it.
2	Circuit diagram of photo diode with correct biasing Light emitting diode OR i) Correct graph with correct marking of points asked in part (a) and (b) ii) The energy gap decreases.

3	Correct steps of derivation with a clear ray diagram.
4	(a) The wavelength is given by λ= c/f =1.5×10^-2 m (b) Bo=Eo/c=1.6×10^-7 T (c) Energy density due to the electric field, $E_E=1/2\epsilon_0E^2$ Energy density due to the magnetic field, $E_B=1/2B^2/\mu_o$ on solving above equations, $E_E=E_B$
5	(i) Intensity of incident radiations was kept constant. (ii) Frequency v_1 is highest because the stopping potential is more negative for higher frequencies of incident radiation.
6	Total energy E=-13.6 eV K.E = -E = 13.6 eV P.E = -2. K. E = -2 x13.6 = -27.2 e V.
7	Correct labelled diagram Correct expression
8	a) Correct derivation of lens formula with ray diagram b) Time taken for 360° shift = 24 h

Time taken for 1° shift = 24/360 h

= 4 min.

OR



$$r = \frac{AB}{2} = OA = OB$$

As $\mu = \frac{1}{\sin C}$

$$\sin C = \frac{1}{\mu} = \frac{1}{1.33} = 0.75$$

$$C = \sin^{-1}(0.75) = 48.6^\circ$$

In ΔOBS, $\tan C = \frac{OB}{OS}$ $\therefore OB = OS \tan C = 0.8 \tan 48.6^\circ$

$r = 0.8 \times 1.1345 = 0.907m$

Area of the surface of water through which light emerges $= \pi r^2 = 3.14(0.907)^2 = 2.518m^2$.

9

a) Yes. In the prism, colors are produced due to the dispersion of light. The colors of a soap film are due to the interference of light.

b) Directions of various minima in diffraction pattern are given by

$\theta n = n\lambda/d$

	We know that the wavelength of blue light is less than that of red light. So diffraction bands become narrower and crowded together.
10	a) This is because of the fact that nuclear forces between neutrons are weaker than that between protons. b) Energy, $E = 10^{-3} \times (3 \times 10^8)^2$ J $E = 10^{-3} \times 9 \times 10^{16} = 9 \times 10^{13}$ J Thus, if one gram of matter is converted to energy, there is a release of enormous amount of energy.
11	The ratio of intensity of maxima and minima is $\frac{I_{max}}{I_{min}} = \frac{(\sqrt{I_1} + \sqrt{I_2})^2}{(\sqrt{I_1} - \sqrt{I_2})^2} = \frac{(A_1 + A_2)^2}{(A_1 - A_2)^2}$ $\frac{I_{max}}{I_{min}} = \frac{(A_1 + A_2)^2}{(A_1 - A_2)^2} = \frac{100}{64}$ $\Rightarrow \frac{(A_1 + A_2)}{(A_1 - A_2)} = \frac{10}{8}$ $\Rightarrow 8A_1 + 8A_2 = 10A_1 - 10A_2$ $\Rightarrow \frac{A_1}{A_2} = \frac{9}{1}$ As, $\frac{I_1}{I_2} = \left(\frac{A_1}{A_2}\right)^2$ $\frac{I_1}{I_2} = \frac{81}{1}$ OR

	$\beta_0 = \frac{2D\lambda}{b}$ Given, distance of slit from the screen, $D = 2m$ $\therefore \beta_0 = \frac{2 \times 2 \times 600 \times 10^{-9}}{0.6 \times 10^{-3}} = 4mm$
12	a) (iii) b) (ii) c) (iv) d) (ii) e) (i) From the curve, I = 20 mA, V = 0.8 V, I = 10 mA when V = 0.7 V Now, R = Δ V/Δ I = 0.1 V/10 mA = 0.1 V/10 x 10^{-3}A = 10 Ω.