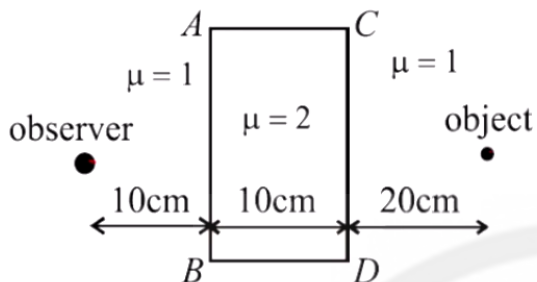


Prayas JEE (2025)

Physics Ray Optics

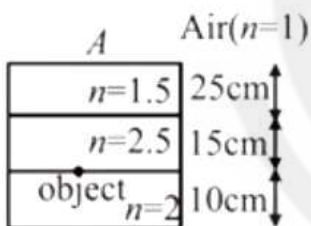
DPP: 7

Q1 Find the apparent distance between the observer and the object shown in the figure:



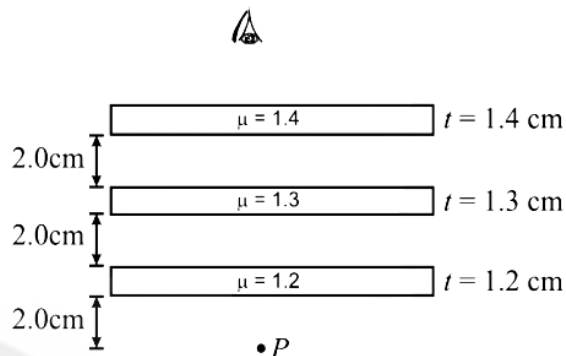
- (A) 35 cm
- (B) 20 cm
- (C) 10 cm
- (D) None of these

Q2 Find the apparent depth of the object seen by observer A (in the figure shown)



- (A) $\frac{50}{3}$ cm
- (B) $\frac{45}{3}$ cm
- (C) $\frac{68}{3}$ cm
- (D) None of these

Q3 Locate the image of the point P as seen by the eye in the figure.



- (A) .6 cm above P
- (B) 0.3 cm above P
- (C) 0.9 cm above P
- (D) None of these

Q4 A small object is placed at the centre of the bottom of a cylindrical vessel of radius 3 cm and height $3\sqrt{3}$ cm filled completely with a liquid. Consider the ray leaving the vessel through a corner. Suppose this ray and the ray along the axis of the vessel are used to trace the image. Find the apparent depth of the image. Refractive index of liquid = $\sqrt{3}$.

- (A) $\sqrt{5}$ cm
- (B) $\sqrt{2}$ cm
- (C) $\sqrt{3}$ cm
- (D) $\sqrt{6}$ cm

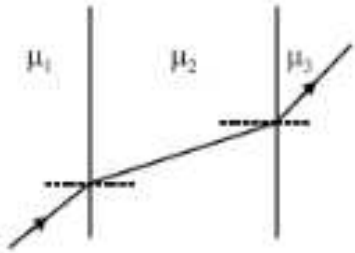
Q5 Figure below shows the paths of a portion of a ray of light as it passes through three different materials. Mark the correct relation among refractive indices of three materials



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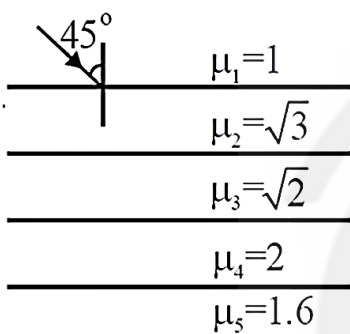
[iOS App](#)

[PW Website](#)



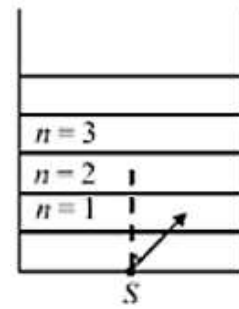
- (A) $\mu_1 > \mu_2 > \mu_3$
- (B) $\mu_2 > \mu_1 > \mu_3$
- (C) $\mu_1 > \mu_3 > \mu_2$
- (D) $\mu_2 > \mu_3 > \mu_1$

Q6 In the figure shown, the angle made by the light ray with the normal in the medium of refractive index $\sqrt{2}$ is



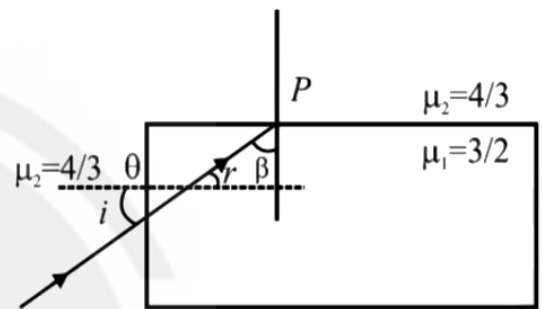
- (A) 30°
- (B) 60°
- (C) 90°
- (D) None of these

Q7 A point source S is placed at the bottom of different layers as shown in the figure. The refractive index of bottom most layer is μ_0 . The refractive index of any other upper layer is $\mu(n) = \mu_0 - \frac{\mu_0}{4n-18}$ where $n = 1, 2, \dots$. A ray of light with angle i slightly more than 30° starts from the source. Total internal reflection takes place at the upper surface of a layer having n equal to



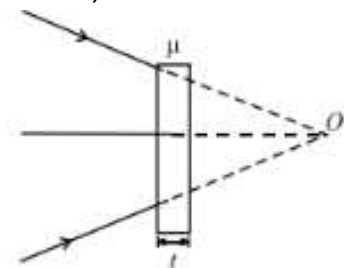
- (A) 3
- (B) 5
- (C) 4
- (D) 6

Q8 In the shown figure, the minimum value of i so that total internal reflection never takes place at P .



- (A) $\cos^{-1}[\sqrt{8}/17]$
- (B) $\sin^{-1}[\sqrt{8}/17]$
- (C) $\cos^{-1}[\sqrt{17}/8]$
- (D) $\sin^{-1}[\sqrt{17}/8]$

Q9 A beam of light is converging towards a point O . A plane parallel plate of glass of thickness t , refractive index μ is introduced in the path of the beam as shown in the figure. The convergent point is shifted by (assume near normal incidence):

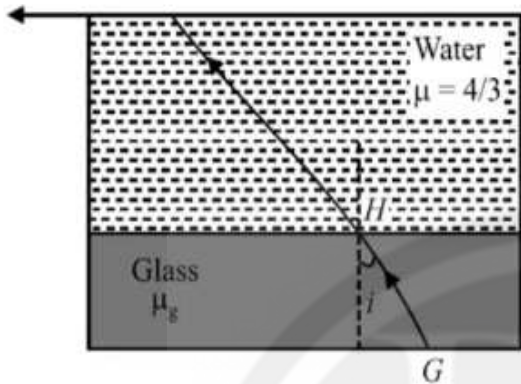


- (A) $t \left(1 - \frac{1}{\mu}\right)$ away
- (B) $t \left(1 + \frac{1}{\mu}\right)$ away



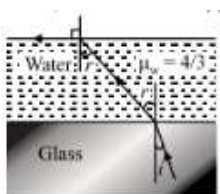
- (C) $t \left(1 - \frac{1}{\mu}\right)$ nearer
- (D) $t \left(1 + \frac{1}{\mu}\right)$ nearer

Q10 A ray of light travels in the fashion as shown in the figure. After passing through water, the ray grazes along the water-air interface. The value of μ_g in terms of i is



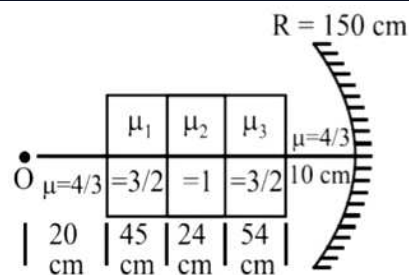
- (A) $\frac{1}{\sin i}$
- (B) $\frac{3}{4 \sin i}$
- (C) $\frac{4}{3 \sin i}$
- (D) None of these

Q11 A ray of light is incident at the glass-water interface at an angle i , it emerges finally parallel to the surface of water, then the value of μ_g would be



- (A) $(4/3) \sin i$
- (B) $1 / \sin i$
- (C) $4/3$
- (D) 1

Q12 In the figure shown, find the distance of the final image from the concave mirror



- (A) 150 cm
- (B) 143 cm
- (C) 153 cm
- (D) 170 cm



Answer Key

Q1 A
Q2 C
Q3 C
Q4 C
Q5 B
Q6 A

Q7 C
Q8 D
Q9 A
Q10 A
Q11 B
Q12 C



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