

Prayas JEE (2025)

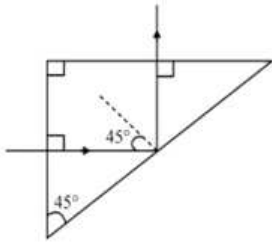
Physics

Ray Optics

DPP: 8

- Q1** A car is moving towards a plane mirror at a speed of 30 m/s . Then the relative speed of its image with respect to the car will be-
- (A) 30 m/s
 (B) 60 m/s
 (C) 15 m/s
 (D) 45 m/s
- Q2** A ray of monochromatic light is incident on one refracting face of a prism of angle 75° . It passes through the prism and is incident on the other face at the critical angle. If the refractive index of the material of the prism is $\sqrt{2}$, the angle of incidence on the first face of the prism is
- (A) 30°
 (B) 45°
 (C) 60°
 (D) 0°
- Q3** A prism having refractive index $\sqrt{2}$ and refracting angle 30° , has one of the refracting surfaces polished. A beam of light incident on the other refracting surface will retrace its path if the angle of incidence is:
- (A) 0°
 (B) 30°
 (C) 45°
 (D) 60°
- Q4** An equilateral prism deviates a ray through 40° for two angles of incidence differing by 20° . The possible angles of incidences are:
- (A) 40°
 (B) 50°
 (C) 20°
 (D) 60°
- Q5** A Prism of refractive index $\sqrt{2}$ has refracting angle 60° . In order that a ray suffers minimum deviation it should be incident at an angle:
- (A) 45°
 (B) 90°
 (C) 30°
 (D) None
- Q6** A Prism of refractive index $\sqrt{2}$ has refracting angle 60° . Angle of minimum deviation is:
- (A) 45°
 (B) 90°
 (C) 30°
 (D) None
- Q7** A Prism of refractive index $\sqrt{2}$ has refracting angle 60° . Angle of maximum deviation is:
- (A) 45°
 (B) $\sin^{-1}(\sqrt{2} \sin 15^\circ)$
 (C) $30^\circ + \sin^{-1}(\sqrt{2} \sin 15^\circ)$
 (D) None
- Q8** A light ray is incident perpendicularly to one face to a 90° prism and is totally internally reflected at the glass-air interface. If the angle of reflection is 45° , we conclude that the refractive index n is


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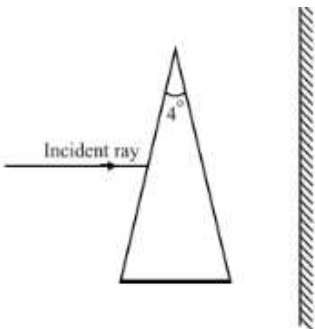


- (A) $n < \frac{1}{\sqrt{2}}$
- (B) $n > \sqrt{2}$
- (C) $n > \frac{1}{\sqrt{2}}$
- (D) $n < \sqrt{2}$

Q9 When light rays are incident on a prism at an angle of 45° , the minimum deviation is obtained. If refractive index of the material of prism is $\sqrt{2}$, then the angle of prism will be

- (A) 30°
- (B) 40°
- (C) 50°
- (D) 60°

Q10 Figure shows a small angled prism of prism angle 4° and $\mu = \frac{3}{2}$. A light ray almost normally incident on the prism is refracted and falls on a vertical mirror as shown. Find the total deviation of the ray after reflection from the mirror.



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Answer Key

Q1 B
Q2 B
Q3 C
Q4 A, D
Q5 A

Q6 C
Q7 C
Q8 B
Q9 D
Q10 (178° clockwise)



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