Physicsaholics

DPP – 10 (Geometrical Optics)

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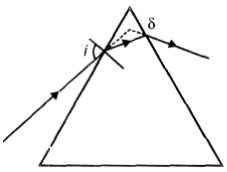
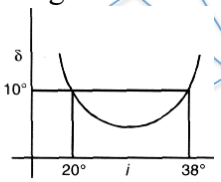
Q 1. A beam of monochromatic light is incident at i = 50^0 on one face of an equilateral prism, the angle of emergence is 40^0 , then the angle of minimum deviation is:
(a) 30^0 (b) $< 30^0$ (c) $\leq 30^0$ (d) $\geq 30^0$

Q 2. A ray is incident on prism at an angle i with normal, when it comes out of prism its angular deviation is δ. Graph between δ and i is given. Prism angle is





(a) 68° (b)60° (c) 48° (d)29°

Q 3. What is the minimum value of refractive index for an equilateral prism so that rays do not emerge from opposite side?
(a) μ = 1.15 (b) μ = 2 (c) μ = 1.33 (d) μ = 1.6

Q 4. The angle of incidence for an equilateral prism is 45°, what should be the refractive index of prism material so that the ray is parallel to the base inside prism
(a) 1.3 (b)1.4 (c)1.5 (d)1.6

Q 5. The limiting angle of incidence of a ray that can be transmitted by an equilateral prism of μ = $\sqrt{\frac{7}{3}}$ is
(a) π/6 (b) π/3 (c) π/4 (d) π/5

Q 6. A glass prism has μ = 1.5 and the refracting angle is 90°. If a ray falls on it at angle of incidence of 30° then what will be the angle of emergence:
(a) 60°
(b) 30°
(c) 45°
(d) The ray will not come out from opposite surface of prism

Q 7. If the refracting angle of a prism or prism angle is 60º and minimum deviation 30º, the angle of incidence will be:
(a) 30º (b) 45º (c) 60º (d) 90º

Q 8. The maximum value of index of refraction of a material of a prism which allows the passage of light through it when the refracting angle of the prism is A is

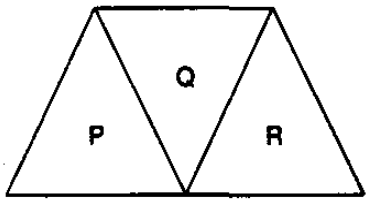
(a) $\sqrt{1+sin\left(\frac{A}{2}\right)}$ (b) $\sqrt{1+cos\left(\frac{A}{2}\right)}$

(c) $\sqrt{1+tan^2\left(\frac{A}{2}\right)}$ (d) $\sqrt{1+cot^2\left(\frac{A}{2}\right)}$

Q 9. The refractive index of a prism is 2. For no total internal reflection of any ray by prism, it can have a maximum refracting angle of:

(a) 90° (b) 60° (c) 45° (d) 30°

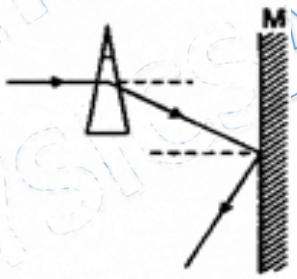
Q 10. A given ray of light suffers minimum deviation in an equilateral prism P. Additional prism Q and R of identical shape and of the same material as P are now added as shown in the figure. The ray will suffer:



(a) greater deviation (b) no deviation

(c) same deviation as before (d) total internal reflection

Q 11. A horizontal ray of light passes through a prism of μ =1.5 whose apex angel is 4° and then strikes a vertical mirror M as shown. The ray after reflections to become horizontal the mirror must be rotated through an angle of



(a) 2° (b) 3° (c) 4° (d) 1°

Q 12. For an equilateral prism, it is observed that when a ray strikes grazingly at one face it emerges grazingly at the other. Its refractive index will be:

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{2}{\sqrt{3}}$

(c) 2 (d) data not sufficient

Q 13. For a ray passing through a prism, values of i and e are 36^0 and 42^0 respectively. Then angle of incidence for minimum deviation cannot be

(a) 37^0 (b) 38^0 (c) 39^0 (d) 40^0

Answer Key

Q.1 b	**Q.2 c**	**Q.3 b**	**Q.4 b**	**Q.5 a**
Q.6 d	**Q.7 b**	**Q.8 d**	**Q.9 d**	**Q.10 c**
Q.11 d	**Q.12 c**	**Q.13 c, d**		