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JEE MAIN RAY OPTICS AND OPTICAL INSTRUMENTS — REFRACTION THROUGH A PRISM, DISPERSION — PYQS

Max. Marks: 48 **Questions:** 12

Section A (MCQ) — 11 questions

Q.1 Angle of minimum deviation is equal to the half of the angle of prism in an equilateral prism. The refractive index of the prism is _____.

[JEE Main 2026 (Online) 6th April Evening Shift]

(1) 1.5 (2) $\sqrt{3}$ (3) $\sqrt{2}$ (4) 1.65

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Q.2 A ray of light passing through an equilateral prism is having velocity 2.12×10^8 m/s in the prism material, then the minimum angle of deviation is _____ degrees.

[JEE Main 2026 (Online) 5th April Morning Shift]

(1) 45 (2) 30 (3) 28 (4) 58

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Q.3 For a thin symmetric prism made of glass (refractive index 1.5), the ratio of incident angle and minimum deviation will be _____.

[JEE Main 2026 (Online) 2nd April Morning Shift]

(1) 3 : 4 (2) 3 : 2 (3) 2 : 1 (4) 1 : 2

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Q.4 For a transparent prism, if the angle of minimum deviation is equal to its refracting angle, the refractive index n of the prism satisfies.

[JEE Main 2026 (Online) 28th January Evening Shift]

(1) $n \geq 2$ (2) $\sqrt{2} < n < 2$

(3) $1 < n < 2$ (4) $\sqrt{2} < n < 2\sqrt{2}$

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Q.5 The exit surface of a prism with refractive index n is coated with a material having refractive index $\frac{n}{2}$. When this prism is set for minimum angle of deviation, it exactly meets the condition of critical angle. The prism angle is _____.

[JEE Main 2026 (Online) 24th January Morning Shift]

(1) 60° (2) 30° (3) 15° (4) 45°

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Q.6 A thin prism with angle 5° of refractive index 1.72 is combined with another prism of refractive index 1.9 to produce dispersion without deviation. The angle of second prism is _____.

[JEE Main 2026 (Online) 23rd January Morning Shift]

(1) 5° (2) 4° (3) 4.5° (4) 6°

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Q.7 Consider an equilateral prism (refractive index $\sqrt{2}$). A ray of light is incident on its one surface at a certain angle i. If the emergent ray is found to graze along the other surface then the angle of refraction at the incident surface is close to _____

[JEE Main 2026 (Online) 22nd January Morning Shift]

(1) 30° (2) 20° (3) 40° (4) 15°

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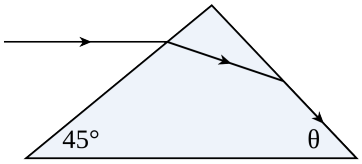
Q.8 As shown in the diagram, when the incident ray is parallel to base of the prism, the emergent ray grazes along the second surface.



If refractive index of the material of prism is $\sqrt{2}$, the angle θ of prism is.

[JEE Main 2026 (Online) 21st January Evening Shift]

(1) 75° (2) 90° (3) 60° (4) 45°

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Q.9 Consider following statements for refraction of light through prism, when angle of deviation is minimum.

A. The refracted ray inside prism becomes parallel to the base.

B. Larger angle prisms provide smaller angle of minimum deviation.

C. Angle of incidence and angle of emergence become equal.

D. There are always two sets of angle of incidence for which deviation will be same except at minimum deviation setting.

E. Angle of refraction becomes double of prism angle.

Choose the correct answer from the options given below : [JEE Main 2025 (Online) 3rd April Morning Shift]

(1) A, B and E Only (2) B, C and D Only

(3) B, D and E Only (4) A, C and D Only

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Q.10 A thin prism P_1 with angle 4° made of glass having refractive index 1.54, is combined with another thin prism P_2 made of glass having refractive index 1.72 to get dispersion without deviation. The angle of the prism P_2 in degrees is

[JEE Main 2025 (Online) 28th January Morning Shift]

(1) 1.5 (2) 16/3 (3) 3 (4) 4

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Q.11 The refractive index of the material of a glass prism is $\sqrt{3}$. The angle of minimum deviation is equal to the angle of the prism. What is the angle of the prism?

[JEE Main 2025 (Online) 23rd January Evening Shift]

(1) 60° (2) 50° (3) 58° (4) 48°

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Section B (Numerical) — 1 question

Q.12 A ray of light suffers minimum deviation when incident on a prism having angle of the prism equal to 60°. The refractive index of the prism material is $\sqrt{2}$. The angle of incidence (in degrees) is _____

[JEE Main 2025 (Online) 2nd April Evening Shift]

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ANSWER KEY

Section A (MCQ) — 11 questions

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**3**	**2**	**2**	**2**	**1**	**2**	**4**	**3**	**4**	**3**	**1**

Section B (Numerical) — 1 question

Ques.	12										
Ans.	**45**										