

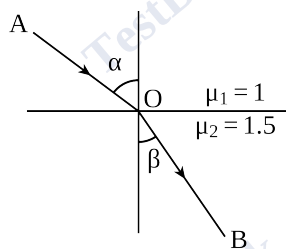
JEE MAIN RAY OPTICS AND OPTICAL INSTRUMENTS — REFRACTION, SNELL'S LAW, APPARENT DEPTH — PYQS

Max. Marks: 24
Questions: 6

Section A (MCQ) — 4 questions

- Q.1** Light ray incident along a vector $\vec{AO}$ ($\vec{AO} = 2\hat{i} - 3\hat{j}$) emerges out along vector $\vec{OB}$ ($\vec{OB} = C\hat{i} - 4\hat{j}$) as shown in the figure below. The value of C is _____.

[JEE Main 2026 (Online) 8th April Evening Shift]



- (1) 1.6 (2) 0.16 (3) 11.6 (4) 16

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- Q.2** The wavelength of light, while it is passing through water is 540 nm. The refractive index of water is $4/3$. The wavelength of the same light when it is passing through a transparent medium having refractive index of $3/2$ is _____ nm.

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

- (1) 540 (2) 840 (3) 480 (4) 380

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- Q.3** Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Refractive index of glass is higher than that of air.

Reason (R): Optical density of a medium is directly proportional to its mass density which results in a proportionate refractive index.

In the light of the above statements, choose the **most appropriate answer** from the options given below:

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
 (2) (A) is correct but (R) is not correct
 (3) (A) is not correct but (R) is correct
 (4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

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- Q.4** A monochromatic light of frequency 5×10^{14} Hz travelling through air, is incident on a medium of refractive index '2'. Wavelength of the refracted light will be:

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 400 nm (2) 300 nm (3) 600 nm (4) 500 nm

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Section B (Numerical) — 2 questions

- Q.5** A container contains a liquid with refractive index of 1.2 up to a height of 60 cm and another liquid having refractive index 1.6 is added to height H above first liquid. If viewed from above, the apparent shift in the position of bottom of container is 40 cm. The value of H is _____ cm. (Consider liquids are immiscible)

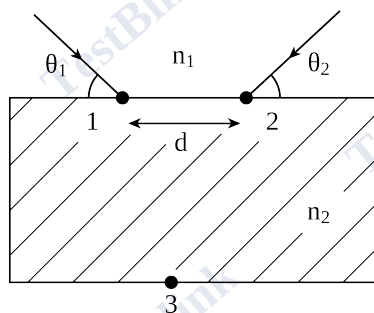
[JEE Main 2025 (Online) 7th April Morning Shift]

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- Q.6** Two light beams fall on a transparent material block at point 1 and 2 with angle θ_1 and θ_2 , respectively, as shown in figure. After refraction, the beams intersect at point 3 which is exactly on the interface at other end of the block. Given : the distance between 1 and 2, $d = 4\sqrt{3}$ cm and $\theta_1 = \theta_2 = \cos^{-1}\left(\frac{n_2}{2n_1}\right)$, where refractive index of the block $n_2 >$ refractive index of the outside medium n_1 , then the thickness of the block is _____ cm.

[JEE Main 2025 (Online) 29th January Morning Shift]



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ANSWER KEY

Section A (MCQ) — 4 questions

Ques.	1	2	3	4							
Ans.	1	3	2	2							

Section B (Numerical) — 2 questions

Ques.	5	6									
Ans.	80	6									