

PART 1 - PHYSICS

Topic : Ray optics and optical instruments

SECTION-A : (Maximum Marks : 12)

This section contains **THREE** questions.

Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).

For each question, choose the option(s) corresponding to (all) the correct answer(s).

Answer to each question will be evaluated according to the following marking scheme :

Full Marks : +4 ONLY if (all) the correct option(s) is(are) chosen;

Partial Marks : +3 If all the four options are correct but ONLY three options are chosen;

Partial Marks : +2 If three or more options are correct but ONLY two options are chosen, both of which are correct;

Partial Marks : +1 If two or more options are correct but ONLY one option is chosen and it is a correct option;

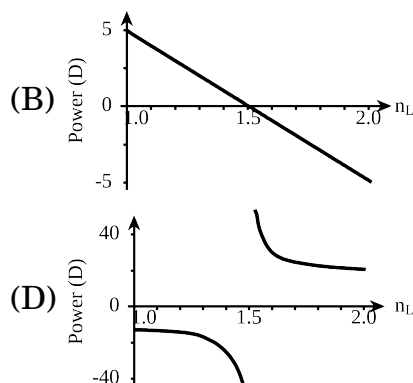
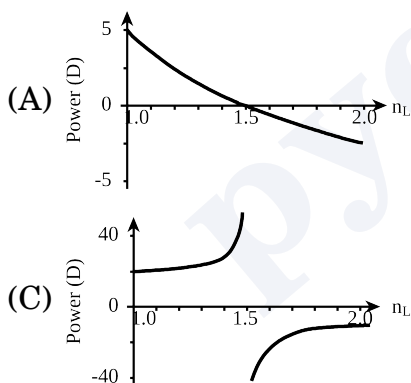
Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);

Negative Marks : -1 In all other cases.

For example, in a question, if (A), (B) and (D) are the ONLY three options corresponding to correct answers, then choosing ONLY (A), (B) and (D) will get +4 marks; choosing ONLY (A) and (B) will get +2 marks; choosing ONLY (A) and (D) will get +2 marks; choosing ONLY (B) and (D) will get +2 marks; choosing ONLY (A) will get +1 mark; choosing ONLY (B) will get +1 mark; choosing ONLY (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get -1 marks.

1. A double convex lens made of glass of refractive index 1.5 and radii of curvature of the curved surfaces 20 cm each is immersed in a liquid of refractive index n_L . The correct plot showing the variation of the power, in the units of diopter (D), as a function of n_L is:

[JEE Advanced 2026 Paper 1]



Scan or tap for the full solution



Space for Rough Work

2. A light ray is incident on the surface of a sphere of refractive index n at an angle of incidence θ_0 . The ray partially refracts into the sphere with angle of refraction φ_0 and then partly reflects from the back surface. The reflected ray then emerges out of the sphere after a partial refraction. The total angle of deviation of the emergent ray with respect to the incident ray is α . Match the quantities mentioned in **List-I** with their values in **List-II** and choose the correct option.

[JEE Advanced 2024 Paper 1]

List-I		List-II	
P.	If $n = 2$ and $\alpha = 180^\circ$, then all the possible values of θ_0 will be	1.	30° and 0°
Q.	If $n = \sqrt{3}$ and $\alpha = 180^\circ$, then all the possible values of θ_0 will be	2.	60° and 0°
R.	If $n = \sqrt{3}$ and $\alpha = 180^\circ$, then all the possible values of φ_0 will be	3.	45° and 0°
S.	If $n = \sqrt{2}$ and $\theta_0 = 45^\circ$, then all the possible values of α will be	4.	150°
		5.	0°

(A) $P \rightarrow 5$; $Q \rightarrow 2$; $R \rightarrow 1$; $S \rightarrow 4$

(B) $P \rightarrow 5$; $Q \rightarrow 1$; $R \rightarrow 2$; $S \rightarrow 4$

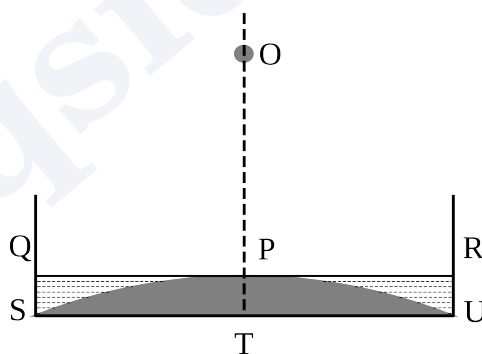
(C) $P \rightarrow 3$; $Q \rightarrow 2$; $R \rightarrow 1$; $S \rightarrow 4$

(D) $P \rightarrow 3$; $Q \rightarrow 1$; $R \rightarrow 2$; $S \rightarrow 5$

Scan or tap for the full solution



3. A glass beaker has a solid, plano-convex base of refractive index 1.60, as shown in the figure. The radius of curvature of the convex surface (SPU) is 9 cm, while the planar surface (STU) acts as a mirror. This beaker is filled with a liquid of refractive index n up to the level QPR. If the image of a point object O at a height of h (OT in the figure) is formed onto itself, then, which of the following option(s) is(are) correct? [JEE Advanced 2024 Paper 1]



(A) For $n = 1.42$, $h = 50$ cm.

(B) For $n = 1.35$, $h = 36$ cm.

(C) For $n = 1.45$, $h = 65$ cm.

(D) For $n = 1.48$, $h = 85$ cm.

Scan or tap for the full solution



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JEE ADVANCED RAY OPTICS AND OPTICAL INSTRUMENTS — REFRACTION AT SPHERICAL SURFACES, THIN LENSES AND LENS MAKER'S FORMULA — PYQS

Test Pattern : **JEE (Advanced)**

ANSWER KEY

SECTION-A

[illegible]