

PART 1 - PHYSICS

Topic : Oscillations

SECTION-A : (Maximum Marks : 4)

This section contains **ONE** question.

Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.

For each question, choose the option corresponding to the correct answer.

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

Full Marks : +4 If **ONLY** the correct option is chosen;

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

Negative Marks : -1 In all other cases.

1. As shown in the figures, a uniform rod OO' of length l is hinged at the point O and held in place vertically between two walls using two massless springs of same spring constant. The springs are connected at the midpoint and at the top-end (O') of the rod, as shown in Fig. 1 and the rod is made to oscillate by a small angular displacement. The frequency of oscillation of the rod is f_1 . On the other hand, if both the springs are connected at the midpoint of the rod, as shown in Fig. 2 and the rod is made to oscillate by a small angular displacement, then the frequency of oscillation is f_2 . Ignoring gravity and assuming motion only in the plane of the diagram, the value of $\frac{f_1}{f_2}$ is: [JEE Advanced 2025 Paper 2]

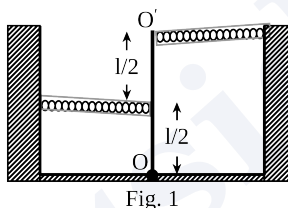


Fig. 1

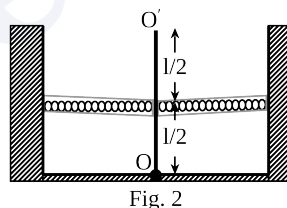


Fig. 2

(A) 2

(B) $\sqrt{2}$

(C) $\sqrt{\frac{5}{2}}$

(D) $\sqrt{\frac{2}{5}}$

Scan or tap for the full solution



Space for Rough Work

SECTION-B : (Maximum Marks : 4)

This section contains **ONE** question.

The answer to each question is a **NUMERICAL VALUE**.

For each question, enter the correct numerical value of the answer (in decimal notation, truncated / rounded-off to the **SECOND DECIMAL PLACE**; e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) in the place designated to enter the answer.

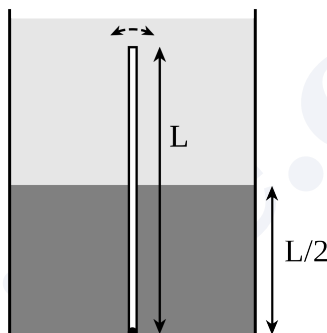
Answer to each question will be evaluated according to the following marking scheme :

Full Marks : +4 If **ONLY** the correct answer is entered;

Zero Marks : 0 In all other cases.

2. A tank contains two immiscible liquids of densities 6ρ and 2ρ . The higher density liquid is filled up to a height $L/2$ from the bottom. A thin rod of density ρ and length L is fully immersed and hinged at the bottom so that it can oscillate freely, as shown in the figure. If the rod is slightly disturbed from its equilibrium, the time period of small oscillations is $\frac{2\pi}{n} \sqrt{\frac{L}{g}}$, where g is the acceleration due to the gravity. The value of n is:

[JEE Advanced 2026 Paper 1]



Scan or tap for the full solution



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**JEE ADVANCED OSCILLATIONS — PHYSICAL
PENDULUM AND ANGULAR SHM (JEE) — PYQS**

Test Pattern : **JEE (Advanced)**

ANSWER KEY

SECTION-A

[illegible]

SECTION-B

[illegible]