

PART 1 - PHYSICS

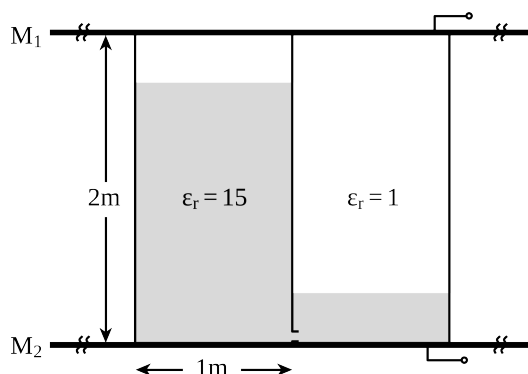
Topic : Mechanical properties of fluids, Electrostatic potential and capacitance

SECTION-1 : (Maximum Marks : 6)

- This section contains **ONE** paragraph.
- Based on each paragraph, there are **THREE** questions.
- 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 : +2 If **ONLY** the correct answer is entered;
 Zero Marks : 0 In all other cases.

Paragraph for Questions 1 and 2

A container of height 2 m, length 2 m and breadth 1 m is made of insulating vertical walls and two large area horizontal metal plates (M_1 and M_2) which extend far beyond the vertical walls in all directions. The container is partitioned into two equal chambers with a thin insulating vertical wall. The partition wall contains a small hole of cross-sectional area $\sqrt{10} \text{ cm}^2$ near its bottom edge. Initially the hole is closed and the left chamber of the container is completely filled with a liquid of dielectric constant $\epsilon_r = 15$ and the right chamber is empty ($\epsilon_r = 1$). At time $t = 0$, the hole is opened and the liquid flows from the left chamber to the right chamber. In both the chambers, the space above the liquid has $\epsilon_r = 1$ and is maintained at atmospheric pressure. The schematic of the container at a time $t > 0$ is shown in the figure. [Given: acceleration due to gravity is 10 m s^{-2} .]



1. The height (in m) of the liquid in left chamber at $t = 500 \text{ s}$ is:

[JEE Advanced 2026 Paper 2]

Scan or tap for the full solution



2. The difference in the capacitance (in F) between the metal plates at $t = 0$ and that at $t = 500 \text{ s}$ is $(8 - n)\epsilon_0$, where ϵ_0 is the permittivity of free space. The value of n is:

[JEE Advanced 2026 Paper 2]

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Space for Rough Work

3. Two large, identical water tanks, 1 and 2, kept on the top of a building of height H , are filled with water up to height h in each tank. Both the tanks contain an identical hole of small radius on their sides, close to their bottom. A pipe of the same internal radius as that of the hole is connected to tank 2, and the pipe ends at the ground level. When the water flows from the tanks 1 and 2 through the holes, the times taken to empty the tanks are t_1 and t_2 , respectively. If $H = \left(\frac{16}{9}\right)h$, then the ratio t_1/t_2 is _____.

[JEE Advanced 2024 Paper 1]

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Space for Rough Work

**JEE ADVANCED MECHANICAL PROPERTIES OF FLUIDS —
BERNOULLI'S PRINCIPLE AND ITS APPLICATIONS — PYQS**

Test Pattern : JEE (Advanced)

ANSWER KEY**SECTION-1**

Ques.	1	2	3									
Ans.	1.25	1.90 to 2.10	3									