

PhysicsByAaryan

CSIR NET . GATE . JEST . BARC - Physics

Capacitors - CSIR NET Physics PYQs

Electromagnetism . All PYQs (2015-2025) with answer key

5 questions . Answer key included

www.physicsbyaaryan.com . www.csirnetphysics.com

Contact: 9501976811

Q1. [June 2016] . 3.5 marks

Electromagnetism > Capacitors

CSIR NET	2016 June	3.5M
----------	-----------	------

Two parallel plate capacitors, separated by distances x and $1.1x$ respectively, have a dielectric material of dielectric constant 3.0 inserted between the plates, and are connected to a battery of voltage V . The difference in charge on the second capacitor compared to the first is

1. +66%
2. +20%
3. -3.3%
4. -10%

Q2. [Dec 2017] . 3.5 marks

Electromagnetism > Capacitors

CSIR NET	2017 Dec	3.5M
----------	----------	------

A rectangular piece of dielectric material is inserted partially into the (air) gap between the plates of a parallel plate capacitor. The dielectric piece will

1. remain stationary where it is placed
2. be pushed out from the gap between the plates
3. be drawn inside the gap between the plates and its velocity does not change sign
4. execute an oscillatory motion in the region between the plates

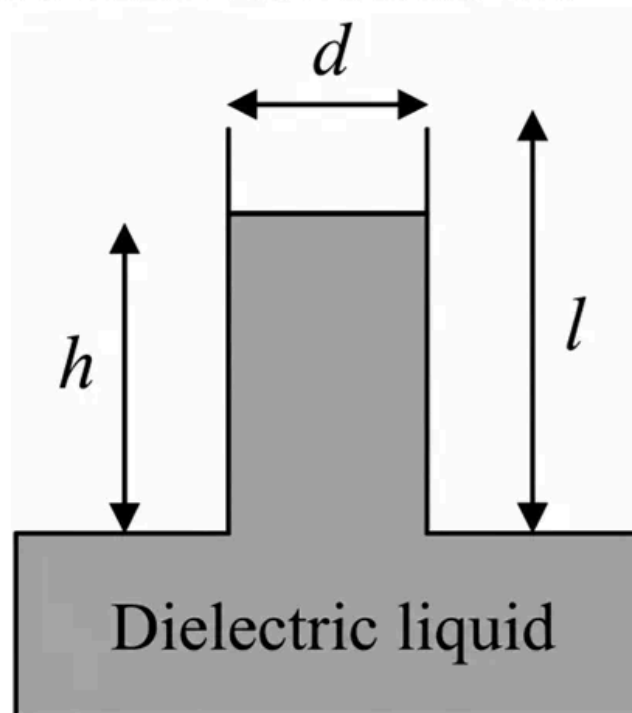
Q3. [June 2020] . 5.0 marks

Electromagnetism > Capacitors

CSIR NET	2020 June	5M
----------	-----------	----

A parallel plate capacitor with rectangular plates of length l , breadth b and plate separation d , is held vertically on the surface of a dielectric liquid of dielectric constant κ and density ρ as shown in the figure. The length and breadth are large enough for edge effects to be neglected. The plates of the capacitor are kept at a constant voltage difference V . Ignoring effects of surface tension, the height h upto which the liquid level rises inside the capacitor, is

1. $\frac{V^2 \epsilon_0 (\kappa - 1)}{\rho g b d}$
2. $\frac{V^2 \epsilon_0 (\kappa - 1)}{2 \rho g b^2}$
3. $\frac{V^2 \epsilon_0 (\kappa - 1)}{2 \rho g d^2}$
4. $\frac{V^2 \epsilon_0 (\kappa - 1)}{\rho g d^2}$



Q4. [June 2024] . 5.0 marks

Electromagnetism > Capacitors

CSIR NET	2024 June	5M
----------	-----------	----

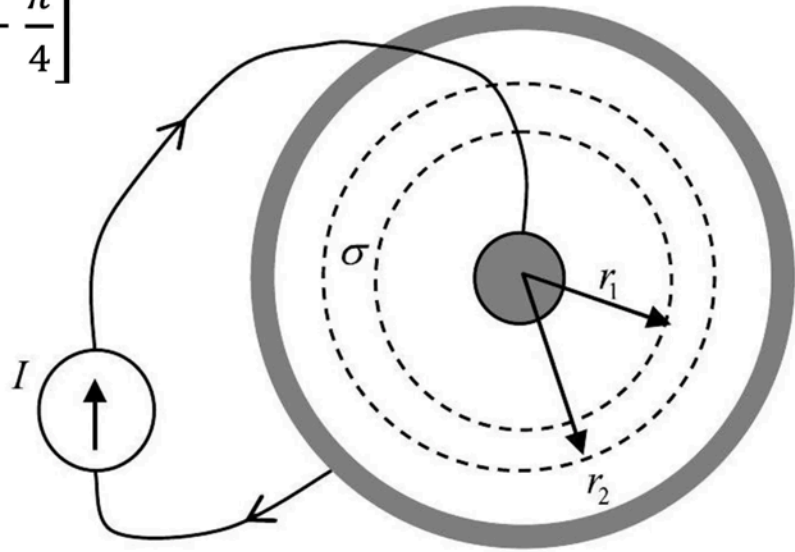
A two-dimensional sheet with a uniform sheet conductivity of σ has a central metallic point contact and a circular metal contact at the boundary as shown in the figure. If a constant current I is injected through the central contact and collected at the boundary, then the voltage difference between two points on the sheet at radius r_1 and r_2 is proportional to

1. $\frac{I}{\sigma} \left[\tan^{-1} \left(\frac{r_2}{r_1} \right) - \frac{\pi}{4} \right]$

2. $\frac{I}{\sigma} \left[\ln \left(\frac{r_2}{r_1} \right) \right]$

3. $\frac{I}{\sigma} \left(\frac{r_2 - r_1}{r_2 + r_1} \right)$

4. $\frac{I}{\sigma} \left(\frac{r_2 - r_1}{r_2 + r_1} \right)^3$



Q5. [Dec 2025] . 3.5 marks

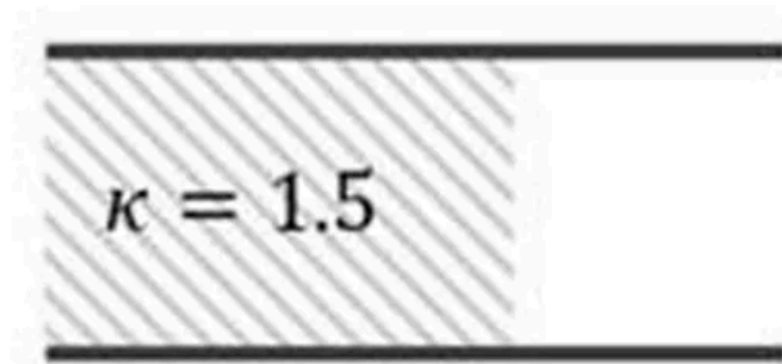
Electromagnetism > Capacitors

CSIR NET	2025 Dec	3.5M	EMT
----------	----------	------	-----

A fraction $\frac{2}{3}$ of the volume of a parallel plate capacitor is filled with dielectric of relative permittivity $\kappa = 1.5$ (as shown in the figure).

When the filled volume is reduced to $\frac{1}{3}$ of the total volume, the capacitance is smaller by a factor of

1. $\frac{7}{8}$
2. $\frac{5}{6}$
3. $\frac{3}{4}$
4. $\frac{2}{3}$



Answer Key

5 questions . Subject and topic for quick revision

Q. No	Subject	Topic	Answer
Q1	Electromagnetism	Capacitors	4
Q2	Electromagnetism	Capacitors	4
Q3	Electromagnetism	Capacitors	3
Q4	Electromagnetism	Capacitors	2
Q5	Electromagnetism	Capacitors	1

Study with PhysicsByAaryan

Full CSIR NET / GATE / JEST / BARC Physics live batch by Aaryan Mehra Sir.
Concept-first teaching, complete PYQ coverage, daily doubt support.

Use coupon CONSISTENCY for Rs. 500 off

Visit

www.physicsbyaaryan.com

www.csirnetphysics.com

Contact

9501976811