

NEET ELECTROSTATIC POTENTIAL AND CAPACITANCE — EFFECT OF DIELECTRIC ON CAPACITANCE — PYQS

Max. Marks: 24

Questions: 6

Section A (MCQ) — 6 questions

- Q.1** The plates of a parallel plate capacitor are separated by d . Two slabs of different dielectric constant K_1 and K_2 with thickness $\frac{3}{8}d$ and $\frac{d}{2}$, respectively are inserted in the capacitor. Due to this, the capacitance becomes two times larger than when there is nothing between the plates. If $K_1 = 1.25K_2$, the value of K_1 is: [NEET (UG) 2025]

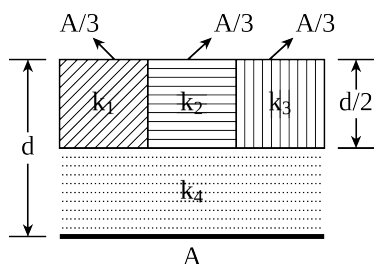
(1) 1.60 (2) 1.33 (3) 2.66 (4) 2.33

Scan or tap for the full solution 

- Q.2** The capacitance of a parallel plate capacitor with air as medium is $6 \mu\text{F}$. With the introduction of a dielectric medium, the capacitance becomes $30 \mu\text{F}$. The permittivity of the medium is : [NEET (UG) 2020]
- ($\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$)
- (1) $1.77 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 (2) $0.44 \times 10^{-10} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 (3) $5.00 \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 (4) $0.44 \times 10^{-13} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$

Scan or tap for the full solution 

- Q.3** A parallel-plate capacitor of area A , plate separation d and capacitance C is filled with four dielectric materials having dielectric constants k_1 , k_2 , k_3 and k_4 as shown in the figure. If a single dielectric material is to be used to have the same capacitance C in this capacitor, then its dielectric constant k is given by [NEET 2016 (Phase 2)]



- (1) $k = k_1 + k_2 + k_3 + 3k_4$
 (2) $k = \frac{2}{3}(k_1 + k_2 + k_3) + 2k_4$
 (3) $\frac{2}{k} = \frac{3}{k_1 + k_2 + k_3} + \frac{1}{k_4}$
 (4) $\frac{1}{k} = \frac{1}{k_1} + \frac{1}{k_2} + \frac{1}{k_3} + \frac{3}{2k_4}$

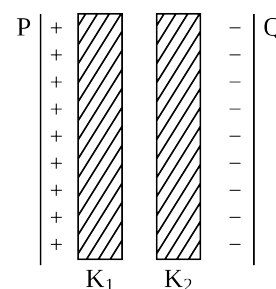
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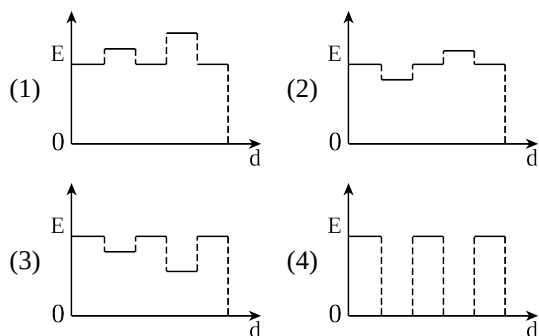
- Q.4** A parallel plate air capacitor of capacitance C is connected to a cell of emf V and then disconnected from it. A dielectric slab of dielectric constant K , which can just fill the air gap of the capacitor, is now inserted in it. Which of the following is incorrect? [AIPMT 2015 (Cancelled)]

- (1) The change in energy stored is $\frac{1}{2}CV^2\left(\frac{1}{K} - 1\right)$
 (2) The charge on the capacitor is not conserved.
 (3) The potential difference between the plates decreases K times.
 (4) The energy stored in the capacitor decreases K times.

Scan or tap for the full solution 

- Q.5** Two thin dielectric slabs of dielectric constants K_1 and K_2 ($K_1 < K_2$) are inserted between plates of a parallel plate capacitor, as shown in the figure. The variation of electric field E between the plates with distance d as measured from plate P is correctly shown by [AIPMT 2014]





Scan or tap for the
full solution



Q.6 Two parallel metal plates having charges $+Q$ and $-Q$ face each other at a certain distance between them. If the plates are now dipped in kerosene oil tank, the electric field between the plates will

[AIPMT 2010 (Mains)]

- (1) become zero (2) increase
(3) decrease (4) remain same

Scan or tap for the
full solution



ANSWER KEY

Ques.	1	2	3	4	5	6					
Ans.	3	2	3	2	3	3					