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JEE MAIN ELECTROSTATIC POTENTIAL AND CAPACITANCE — ENERGY STORED IN A CAPACITOR — PYQS

Max. Marks: 20 **Questions:** 5

Section A (MCQ) — 5 questions

Q.1 A sphere of capacitance 100 pF is charged to a potential of 100 V. Another identical uncharged metal sphere is brought in contact with the charged sphere, then the change in the total energy stored on these spheres, when they touch is $\alpha \times 10^{-7}$ J. The value of α is _____.
(combined capacitance of spheres is 200 pF)

[JEE Main 2026 (Online) 6th April Evening Shift]

(1) 5 (2) $\frac{5}{2}$ (3) $\frac{7}{2}$ (4) $\frac{9}{2}$

Scan or tap for the full solution

Q.2 A parallel plate air capacitor is connected to a battery. The plates are pulled apart at uniform speed v. If x is the separation between the plates at any instant, then the time rate of change of electrostatic energy of the capacitor is proportional to x^{α}, where α is _____.

[JEE Main 2026 (Online) 4th April Morning Shift]

(1) −2 (2) 1 (3) −1 (4) 2

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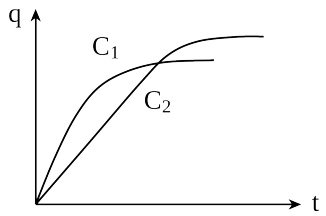
Q.3 Two capacitors C_1 and C_2 are connected in parallel to a battery. Charge-time graph is shown below for the two capacitors. The energy stored with them are U_1 and U_2, respectively. Which of the given statements is true?

[JEE Main 2025 (Online) 28th January Morning Shift]



(1) $C_2 > C_1, U_2 > U_1$ (2) $C_1 > C_2, U_1 > U_2$
(3) $C_2 > C_1, U_2 < U_1$ (4) $C_1 > C_2, U_1 < U_2$

Scan or tap for the full solution

Q.4 A parallel plate capacitor of capacitance 1 μF is charged to a potential difference of 20 V. The distance between plates is 1 μm. The energy density between plates of capacitor is :

[JEE Main 2025 (Online) 28th January Evening Shift]

(1) 1.8×10^3 J/m^3 (2) 2×10^2 J/m^3
(3) 2×10^{-4} J/m^3 (4) 1.8×10^5 J/m^3

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Q.5 Consider a parallel plate capacitor of area A (of each plate) and separation 'd' between the plates. If E is the electric field and ε_0 is the permittivity of free space between the plates, then potential energy stored in the capacitor is

[JEE Main 2025 (Online) 24th January Morning Shift]

(1) $\varepsilon_0 E^2 Ad$ (2) $\frac{3}{4}\varepsilon_0 E^2 Ad$
(3) $\frac{1}{4}\varepsilon_0 E^2 Ad$ (4) $\frac{1}{2}\varepsilon_0 E^2 Ad$

Scan or tap for the full solution

ANSWER KEY

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