PHYSICS: CAPACITANCE

DPP No. : 2

1. The plate separation in a parallel plate condenser is d and plate area is A. If it is charged to V volt & battery is disconnected then the work done in increasing the plate separation to 2d will be–

(1) $\dfrac{3}{2}\dfrac{\varepsilon_0 AV^2}{d}$ 　　(2) $\dfrac{\varepsilon_0 AV^2}{d}$ 　　(3) $\dfrac{2\varepsilon_0 AV^2}{d}$ 　　(4) $\dfrac{\varepsilon_0 AV^2}{2d}$

2. An uncharged capacitor of capacitance 8.0 μF is connected to a battery of emf 6.0 V through a resistance of 24 Ω, then

(i) the current in the circuit just after the connections are made is :

(1) 0.25 A 　　(2) 0.5 A 　　(3) 0.4 A 　　(4) 0 A

(ii) the current in the circuit at one time constant after the connections are made is :

(1) 0.25 A 　　(2) 0.09 A 　　(3) 0.4 A 　　(4) 0 A

3. The distance between the plates of a parallel plate condenser is d. If a copper plate of same area but thickness $\dfrac{d}{2}$ is placed between the plates then the new capacitance will become-

(1) half 　　(2) double 　　(3) one fourth 　　(4) unchanged

4. A parallel plate condenser with plate separation d is charged with the help of a battery so that U_0 energy is stored in the system. A plate of dielectric constant K and thickness d is placed between the plates of condenser while battery remains connected. The new energy of the system will be-

(1) KU_0 　　(2) $K^2 U_0$ 　　(3) $\dfrac{U_0}{K}$ 　　(4) $\dfrac{U_0}{K^2}$

5. The capacitance of a spherical conductor is proportional to

(1) $C \propto R^2$ 　　(2) $C \propto R^{-2}$ 　　(3) $C \propto R$ 　　(4) $C \propto R^{-1}$

6. Stored energy in a charged conductor is

(1) $\dfrac{1}{2}CV^2$ 　　(2) $\dfrac{1}{2}Q^2 V^2$ 　　(3) $\dfrac{1}{2}\dfrac{Q^2}{C^2}$ 　　(4) $\dfrac{1}{2}\dfrac{Q}{C^2}$

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7. Unit of capacitance is

(1) coulomb   (2) volt   (3) henry   (4) farad

8. The capacitance of a capacitor is

(1) directly proportional to the dielectric constant of the medium between the plates

(2) inversely proportional to the dielectric constant of the medium between the plates

(3) proportional to the square of the dielectric constant of the medium between the plates

(4) independent of the dielectric constant of the medium between the plates

9. If the energy of a capacitor of capacitance $2\mu F$ is 0.16 joule, then its potential difference will be

(1) 800 V   (2) 400 V   (3) 16×10^4 V   (4) 16×10^{-4} V

10. A capacitor of $6\mu F$ is charged to such an extent that the potential difference between the plates becomes 50 V. The work done in this process will be

(1) 7.5×10^{-2} J   (2) 7.5×10^{-3} J   (3) 3×10^{-6} J   (4) 3×10^{-3} J

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