DPP

DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 8**

Topic :-ELECTROSTATIC POTENTIAL AND CAPACITANCE

1. A hollow charged metal sphere has radius r. If the potential difference between its surface and a point at a distance $3r$ from the centre is V, then electric field intensity at a distance $3r$ is
   a) $\frac{V}{2r}$ b) $\frac{V}{3r}$ c) $\frac{V}{6r}$ d) $\frac{V}{4r}$
2. Six identical capacitors are joined in parallel, charged to a potential difference of 10 V, separated and then connected in series, *ie*, the positive plate of one is connected to negative plate of other. Then potential difference between free plates is
   a) 10 V b) 30 V c) 60 V d) $\frac{10}{6}V$
3. The potential energy of system of two equal negative point charges of 2μC each held 1m apart in air is ($k = 9 \times 10^9$ SI unit)
   a) 36J b) 3.6×10^{-3} J c) 3.6J d) 3.6×10^{-2}J
4. The flux entering and leaving a closed surface are 5×10^5 and 4×10^5 MKS units respectively, then the charge inside the surface will be
   a) -8.86×10^{-7}C b) 8.85×10^{-7}C c) 8.85×10^{7}C d) 6.85×10^{-7}C
5. A charge $(-q)$ and another charge $(+Q)$ are kept at two points A and B respectively. Keeping the charge $(+Q)$ fixed at B, the charge $(-q)$ at A is moved to another point C such that ABC forms an equilateral triangle of side l. The net work done in moving the charge $(-q)$ is
   a) $\frac{1}{4\pi\varepsilon_0}\ \frac{Qq}{l}$ b) $\frac{1}{4\pi\varepsilon_0}\ \frac{Qq}{l^2}$ c) $\frac{1}{4\pi\varepsilon_0}\ Qql$ d) Zero
6. Potential energy of two equal negative point charges 2μC each held 1 m apart in air is
   a) 2 J b) 2 eV c) 4 J d) 0.036 J
7. Work done in carrying a charge Q_1 once round a circle of radius R with a charge Q_2 at the centre I s
   a) $\frac{Q_1Q_2}{4\pi\varepsilon_0R^2}$ b) Zero c) $\frac{Q_1Q_2}{4\pi\varepsilon_0R}$ d) Infinite
8. The electric potential at a point (x,y) in the x-y plane is given by
   $V = -Kxy$
   The electric field intensity at a distance r from the origin varies as
   a) r^2 b) r c) $2r$ d) $2r^2$
9. The work done in moving an alpha particle between two points having potential difference 25 V is

a) 8×10^{-18}J b) 8×10^{-19}J c) 8×10^{-20}J d) 8×10^{-16}J

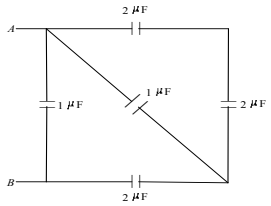
10. Two parallel large thin metal sheets have equal surface charge densities ($\sigma = 26.4 \times 10^{-12}$ Cm^{-2})of opposite signs. The electric field between these sheets is

a) 1.5 NC^{-1} b) $1.5 \times 10^{-10} NC^{-1}$ c) 3 NC^{-1} d) 3×10^{-10} NC^{-1}

11. The electrostatic potential energy between proton and electron separated by a distance 1Å is

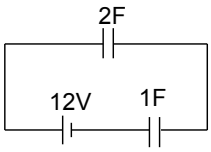
a) 13.6eV b) 27.2eV c) 14.4eV d) 1.44eV

12. Equivalent capacitance between A and B is



a) 14 μF b) 4 μF c) 6 μF d) 2 μF

13. In a circuit shown in figure, the potential difference across the capacitor of 2 F is



a) 8 V b) 4 V c) 12 d) 6 V

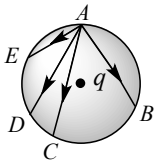
14. A 10 μC capacitor is charged to a potential difference of 50 V and is connected to another uncharged capacitor in parallel. Now the common potential difference becomes 20 V. The capacitance of second capacitor is

a) 15 μF b) 30 μF c) 20 μF d) 10 μF

15. An air parallel plate capacitor has capacity C. The capacity and distance between plates are doubled when immersed in a liquid then dielectric constant of the liquid is

a) 1 b) 2 c) 3 d) 4

16. In the electric field of a point charge q, a certain point charges is carried from point A to B, C, D and E as shown in figure. The work done is



a) Least along the path AE b) Least along the path AC

c) Zero along any one of the paths d) Least along AB

17. Charges $2q, -q$ and $-q$ lie at the vertices of a triangle. The value of E and V at the centroid of equilateral triangle will be

a) $E \neq 0$ and $V \neq 0$ b) $E = 0$ and $V = 0$ c) $E \neq 0$ and $V = 0$ d) $E = 0$ and $V \neq 0$

18. A charged body has an electric flux ϕ associated with it the body is now placed inside a metallic container. The electric flux ϕ_1 associated with the container will be

a) $\phi_1 = 0$ b) $0 < \phi_1 < \phi$ c) $\phi_1 = \phi$ d) $\phi_1 > \phi$

19. A particle A has charge $+q$ and particle B has charge $+4q$ with each of them having the save mass m. when allowed to fall from rest through the same electrical potential difference, the ration of their steeds v_A/v_B will become

a) 2 : 1 b) 1 : 2 c) 1 : 4 d) 4 : 1

20. A sphere of radius 1 m encloses a charge of 5 μC. Another charge of -5 μC is placed inside the sphere. The net electric flux would be

a) Double b) Four times c) Zero d) None of these