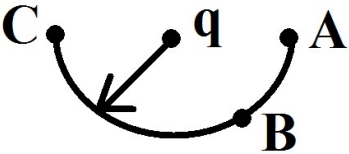
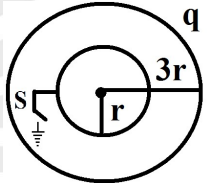


Electric Potential and Capacitance-1

- An electric field $\vec{E} = (2\hat{i} + 3\hat{j}) \frac{N}{C}$ exists in space. The potential difference $(V_P - V_Q)$ between two points whose positions vectors $\vec{r}_P = \hat{i} + 2\hat{j}$ and $\vec{r}_Q = 2\hat{i} + \hat{j} + \hat{k}$ is
 (A) -1 V (B) $+2$ V (C) -3 V (D) $+4$ V
- q is a fixed point charge. The work done in taking a point charge Q from any point P to A is W_A , from P to B is W_B and P to C is W_C . Then
 (A) $W_A < W_B < W_C$
 (B) $W_A > W_B > W_C$
 (C) $W_A = W_B < W_C$
 (D) $W_A = W_B = W_C$

- Two concentric conducting shells of radii r and $3r$. The inner shell is earthed through a switch S . The outer shell has a charge q . The charge that will flow from the inner shell to the earth after the switch S is closed is
 (A) $\frac{q}{4}$ (B) $\frac{q}{3}$
 (C) $\frac{q}{2}$ (D) $\frac{-q}{2}$

- A point P is located 9cm away from a charge $4 \times 10^{-7}\text{C}$. The work done in bringing a charge $2 \times 10^{-9}\text{C}$ from infinity to the point P is
 (A) $2 \times 10^{-5}\text{J}$ (B) $4 \times 10^{-5}\text{J}$ (C) $6 \times 10^{-5}\text{J}$ (D) $8 \times 10^{-5}\text{J}$
- Two charges $3 \times 10^{-8}\text{C}$ and $-2 \times 10^{-8}\text{C}$ are located at $x=0\text{cm}$ and $x=15\text{cm}$ respectively. Taking the potential at infinity as 0 , the points on the x -axis where the electric potential is 0 are
 (A) 6 cm and 20 cm (B) 9 cm and 30 cm
 (C) 9 cm and 45 cm (D) 12 cm and 24 cm
- A regular hexagon of side 10 cm has charge $5\text{ }\mu\text{C}$ at each of its vertices. The potential at the centre of the hexagon is
 (A) $1.8 \times 10^6\text{ V}$ (B) $2.2 \times 10^6\text{ V}$ (C) $2.7 \times 10^6\text{ V}$ (D) $3.6 \times 10^6\text{ V}$
- Two charges $2\text{ }\mu\text{C}$ and $-2\text{ }\mu\text{C}$ are placed at points A and B , 6 cm apart. An equipotential surface of the system is
 (A) a sphere of radius 6 cm , where centre is at the midpoint of AB .
 (B) the perpendicular bisector plane of AB .
 (C) an ellipse of major axis 12 cm and minor axis 6 cm centred at the midpoint of AB .
 (D) No such surface exists.

8. An electron travelling in a region of electrostatic potential V_1 passes into a region of higher potential V_2 . Then the change in its kinetic energy is proportional to
 (A) $(V_2 - V_1)^{1/2}$ (B) $(V_2 - V_1)$ (C) $(V_2 - V_1)^2$ (D) $(V_2 - V_1)/V_1$
9. Equipotential surfaces associated with an electric field which is increasing in magnitude along the x-direction are :
 (A) Planes parallel to yz-plane
 (B) Planes parallel to xy plane
 (C) Planes parallel to xz-plane
 (D) Coaxial cylinders of increasing radii around the x-axis.
10. A tin nucleus has charge $+50e$. If the proton is at a distance 10^{-12} m from the nucleus, then the potential V at this position is (charge on the proton = 1.6×10^{-19} C)
 (A) 14.4×10^4 volt (B) 7.2×10^4 volt
 (C) 7.2×10^8 volt (D) 14.4×10^8 volt
11. A hollow metal sphere of radius 5cm is charged such that the potential on its surface is 10V. The potential at a distance of 2cm from the centre of the sphere is
 (A) zero (B) 10 V (C) 4 V (D) 10/3 V
12. Electric charges $+10\mu\text{C}$, $+5\mu\text{C}$, $-3\mu\text{C}$ and $+8\mu\text{C}$ are placed at the corners of a square of side $\sqrt{2}$ m. The potential at the centre of the square is
 (A) 18×10^5 V (B) 1.8×10^6 V (C) 1.8 V (D) 1.8×10^5 V
13. Given : Electric potential at a point is : $\phi = x^2y + yz$. The electric field at the point (1, 3, 1) is
 (A) 7 units (B) 70 units (C) 49 units (D) 490 units
14. Two concentric spheres of radii R and r have similar charges with equal surface densities (σ). The electric potential at their common centre is
 (A) σ/ϵ_0 (B) $\frac{\sigma}{\epsilon_0}(R - r)$ (C) $\frac{\sigma}{\epsilon_0}(R + r)$ (D) $\frac{\sigma}{4\pi\epsilon_0}(R + r)$
15. A 5C charge experiences a force of 2000 N when moved between two points separated by a distance of 2cm in a uniform electric field. The potential difference between the two points is
 (A) 8 V (B) 200 V (C) 800 V (D) 20000 V

Physics Worksheet-7					Electric Potential and Capacitance-1					25-01-2019				
1-A	2-D	3-B	4-D	5-C	6-C	7-B	8-B	9-A	10-B	11-B	12-D	13-A	14-C	15-A