

LAKSHYA (JEE)

Electrostatic Potential & Capacitance

DPP-01

- (i) Calculate the potential at a point P due to a charge of 4×10^{-7} C located 9 cm away. (ii) Hence obtain the work done in bringing a charge of 2×10^{-9} C from infinity to the point P. Does the answer depend on the path along which the charge is brought?
- Electric field intensity at point 'B' due to a point charge 'Q' kept at point 'A' is 24 NC^{-1} and the electric potential at point 'B' due to same charge is 12 JC^{-1} . Calculate the distance AB and also the magnitude of charge Q.
- At a point due to a point charge, the values of electric field intensity and potential are 32 NC^{-1} and 16 JC^{-1} , respectively. Calculate the

 - magnitude of the charge, and
 - distance of the charge from the point of observation.
- Three charges $q_1 = 1 \mu\text{C}$, $q_2 = -2 \mu\text{C}$, and $q_3 = -1 \mu\text{C}$ are placed at A(0, 0, 0), B(-1, 2, 3), and C(2, -1, 1). Find the potential of the system of three charges at P(1, -2, -1).
- When a $2 \mu\text{C}$ charge is carried from point A to point B, the amount of work done by the electric field is $50 \mu\text{J}$. What is the potential difference and which point is at a higher potential?

 - 25 V, B
 - 25 V, A
 - 20 V, B
 - both are at same potential
- Two charges 3×10^{-8} C and -2×10^{-8} C are located 15 cm apart. At what point on the line joining the two charges is the electric potential zero? Take the potential at infinity to be zero.
- A charge $q = +1 \mu\text{C}$ is held at O between the points A and B such that $AO = 2$ m and $BO = 1$ m, as shown in Fig. (a). Calculate the potential difference ($V_A - V_B$). What will be the value of the potential difference ($V_A - V_B$) if position of B is changed as shown in the Fig (b).
- Calculate the electric potential at the center of a square of side $\sqrt{2}$ m, having charges $100 \mu\text{C}$, $-50 \mu\text{C}$, $20 \mu\text{C}$, and $-60 \mu\text{C}$ at the four corners of the square.
- Charges of 2.0×10^{-6} C and 1.0×10^{-6} C are placed at the corners A and B of a square of side 5.0 cm as shown in Fig. How much work will be done in moving a charge of 1.0×10^{-6} C from C to D against the electric field?

ANSWER KEY

1. (i) $4 \times 10^4 \text{ V}$ (ii) $8 \times 10^{-5} \text{ J}$. No, the answer does not depend upon the path.
2. $0.667 \times 10^{-9} \text{ C}$
3. (a) $\frac{8}{9} \times 10^{-9} \text{ C}$ (b) 0.5 m
4. $V_p = -3 \times 10^3 \text{ V}$
5. (B)
6. 9 cm and 45 cm from positive charge towards negative charge
7. $-4500 \text{ V}, -4500 \text{ V}$
8. $9 \times 10^4 \text{ V}$
9. 0.053 J



Note - If you have any query/issue

Mail us at support@physicswallah.org



support@physicswallah.org