

four charges are placed at the corners of a square with sides of length 'd' the electric potential at point 'X' in the center of the square is?

**Solution**

If 'r' is the distance of any corner to the center of the square, then  $r = \frac{d}{\sqrt{2}}$ , where 'd' is the side of the square. So that potential at the center of the square  $V_X = 4 \times V_c$ ,  $V_c$  where is potential due to each charge at the center:

$$V_c = \frac{kq}{r} = \sqrt{2} \frac{kq}{d},$$

where k is the Coulomb's constant, q is charge.

$$\text{So } V_X = 4 \times \sqrt{2} \frac{kq}{d} = 4\sqrt{2} \frac{kq}{d}.$$

**Answer:**  $4\sqrt{2} \frac{kq}{d}$ .