NIRJA SAHAY DAV PUBLIC SCHOOL , KANKE RANCHI

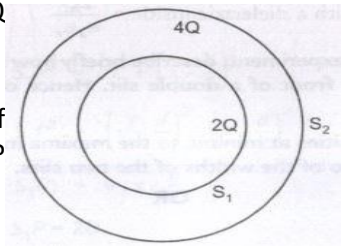
SUMMER HOLIDAY HOME WORK

SUBJECT – PHYSICS STD - XII

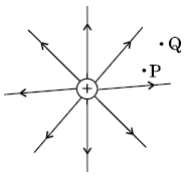
GENERAL INSTRUCTIONS –

- **Solve the following problems in HW COPY**
- **Submission date – re-opening day**

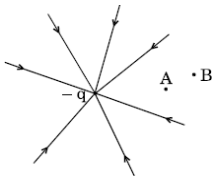
1. An electric dipole is placed in a uniform electric field, what is the net force acting on it? CBSE (DC)-2001
2. An electric dipole of dipole moment p is placed in a uniform electric field E. Write the value of the angle between p and E for which the torque experienced by the dipole is minimum. CBSE (DC)-2009
3. Depict the orientation of the dipole in (i) stable, (ii) unstable equilibrium in a uniform electric field. CBSE (D)-2017,2010
4. Find the work done in rotating the dipole from stable to unstable equilibrium in a uniform electric field.
5. Find the work done in rotating the dipole from unstable to stable equilibrium in a uniform electric field.
6. Define electric flux. Write its S.I. unit. CBSE (AIC)-2017,(AI)-2015,2012,2008,(F)-2006,(D)-2007,2006
7. State Gauss's law in electrostatics. CBSE (AI)-2015,2012,2007,2004,(F)-2012,(D)-2008,2006,2004
8. A charge q is enclosed by a spherical surface R . If the radius is doubled/ reduced to half, how would the electric flux through the surface change? CBSE (AI)-2009, (AIC)-2008,(DC)-2007
9. A charge q is placed at the centre of a cube, what is the electric flux passing through one of its faces ?
10. Consider two hollow concentric spheres, S1 & S2, enclosing charges 2Q & 4Q respectively as shown.
    (a) Find out the ratio of the electric flux through them.
    (b) how will the electric flux through the sphere S1 change, if a medium of dielectric constant 2 is introduced in the space inside S1 in place of air ? Deduce the necessary expression



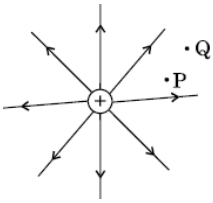
11. (i)Define electric potential energy of a system of charges. CBSE (AI)-2015
    (ii) Write an expression of electric potential energy of a system of two charges.
12. The figure shows field lines of a positive point charge. What will be the sign of the potential energy difference of a small negative charge between the points q and p. Justify your answer. CBSE (AI)-2015, (F)-2014



13. Figure shows the field lines of a negative point charge. Give the sign of the potential energy deference of a small negative charge between the points A and B . CBSE (F)-2014

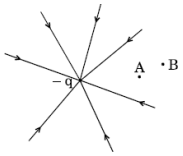


14. The figure shows field lines of a positive point charge. Is the work done by the field in moving a small positive charge from q to p is positive or negative ? Justify your answer. CBSE(F)-2014



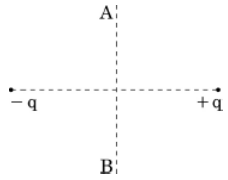
15. The field lines of a negative point charge are as shown in the figure. Does the kinetic energy of a small negative charge increase or decrease in going from B to A? CBSE (AI)-2015
16. (i) Define an equipotential surface? CBSE (AI)-2016,2015,2002,(D)-2003
    (ii). Write any two properties of an equipotential surface.

17. "For any charge configuration, equipotential surface through a point is normal to the electric field." Justify this statement. CBSE (AI)-2016,(D)-2014
18. No work done in moving a charge from one point to another on an equipotential surface. Why ?CBSE (AIC)-



    2002
19. Can electric field exist tangential to an equipotential surface ? Give reason. CBSE (AI)-2016
20. Why the equipotential surfaces about a single charge are not equidistant ? CBSE (AI)-2016,2015,(DC)-2011
21. Why does the separation between successive equipotential surfaces get wider as the distance from the charges increases ?
22. Draw an equipotential surface in a uniform electric field. CBSE (F)-2008,2006,(D)-2001

23. Draw an equipotential surface and corresponding electric field lines for a single point charge (i)+q (q > 0) (ii)-q (q < 0).
24 (i) Draw the equipotential surfaces for an electric dipole. CBSE (AI)-2015
    (ii) Draw the equipotential surfaces due to two equal positive point charges placed at a certain distance.
25. A charge q is being moved from a point A above a dipole of dipole moment p to a point below the dipole in equatorial plane without acceleration. Find the work done in the process. CBSE (AI)-2016



ACTIVITIES

GENERAL INSTRUCTION –

Write the following activities in the physics Lab manual notebook.

SECTION A

1. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
2. To assemble the components of a given electrical circuit.
3. To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.

SECTION -B

1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
2. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
3. To study the nature and size of the image formed by a (i) convex lens, or (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).