



INDIAN SCHOOL DARSAIT
DEPARTMENT OF PHYSICS



Subject : PHYSICS Topic : ELECTRIC CHARGES Date of Worksheet : 23.3.17
AND FIELDS

Resource Person: SUSAN ANIL

Worksheet #1

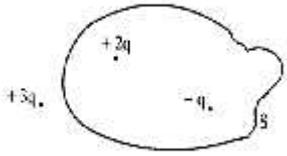
Name of the Student : _____

Class & Division : _XII_____

Roll Number : __

ONE MARK QUESTIONS-

1.	Two electrically charged particles, having charges of different magnitude, when placed at a distance d from each other, experience a force of attraction F . These two particles are put in contact and again placed at the same distance from each other. (i) What is the nature of new force between them? (ii) Is the magnitude of the force of interaction between them now more or less than F ? (2010)
2.	Two equal balls having equal positive charge ' q ' coulombs are suspended by two insulating strings of equal length. What would be the effect on the force when a plastic sheet is inserted between them?(2014)
3.	Plot a graph showing the variation of coulomb force F versus $1/r^2$, where r is the distance between the two charges of each pair of charges: ($1\mu\text{C}$, $2\mu\text{C}$) and ($2\mu\text{C}$, $-3\mu\text{C}$). Interpret the graph obtained.(2011)
4.	The sum of two point charges is $7\mu\text{C}$. They repel each other with a force of 1N when kept 30cm apart in free space. Calculate the value of each charge.
5.	Two point charges ' q_1 ' and ' q_2 ' are placed at a distance ' d ' apart as shown in the figure. The electric field intensity is zero at a point ' P ' on the line joining them. Write two conclusions that you can draw from this. (2014) 
6.	Why electric field lines never cross each other? (2012,2014)
7.	Why do the electric field lines not form closed loop? (2014)
8.	Figure shows a point charge $+Q$, located at a distance $R/2$ from the centre of a spherical metal shell. Draw the electric field lines for the given system. (2016) 
9.	Draw a plot showing variation of electric field (E) with distance r due to a point charge Q . (2012)
10.	Define electric dipole moment. Write its SI unit. (2011,2012)
11.	Two dipoles, made from charges $\pm q$ and $\pm Q$ respectively, have equal dipole moments. Give the (i) ratio between the separations of these two pair of charges, (ii) angle between the dipole axis of these two dipoles.(2013)

12.	In which orientation, a dipole placed in uniform electric field is in (i) stable, (ii) unstable equilibrium? (2010)
13.	What is the angle between the direction of electric field at any (i) axial point, and (ii) equatorial point due to an electric dipole?
14.	A proton is placed in uniform electric field directed along the positive X-axis. In which direction will it tend to move? (2011)
15.	An electric dipole is placed in an electric field in each of the figures (a) and (b). How will the dipole move in these two cases? (2010) <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(a)</p>  </div> <div style="text-align: center;"> <p>(b)</p>  </div> </div>
16.	A 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 torque experienced by the dipole is minimum. (2010)
17.	Define the term 'electric flux'. Write its SI unit.
18.	Two charges of magnitude $-2Q$ and $+Q$ are located at points $(a,0)$ and $(4a,0)$ respectively. What is the electric flux due to these charges through a sphere of radius ' $3a$ ' with its centre at the origin? (2013)
19.	A charge ' q ' is placed at the centre of a cube of side ' a '. What is the flux passing through each face of the cube? (2012)
20.	Charges of magnitude $2Q$ and $-Q$ are located at points $(a,0,0)$ and $(4a,0,0)$. Find the ratio of the flux of electric field due to these charges, through concentric spheres of radii $2a$ and $8a$ centered at the origin. (2010)
21.	How does the electric flux due to a point charge enclosed by a spherical Gaussian surface get affected when its radius is increased?
22.	An electric dipole of dipole moment $20 \times 10^{-6} \text{ Cm}$ is enclosed by a closed surface. What is the net flux coming out of the surface?
23.	Figure shows three point charges, $+2q$, $-q$ and $+3q$. Two charges $+2q$ and $-q$ are enclosed within a surface ' S '. What is the electric flux due to this configuration through the surface ' S ' ? <div style="text-align: center;">  </div>