

CHOITHRAM SCHOOL MANIKBAGH INDORE

CLASS XII- Session: 2018-19

Subject: Physics

Allotment Date: 26/04/2018

Submission Date: 13/06/2018

Assignment No: I

S.No.	Questions	Level	Mark
OBJECTIVE			
Q.1	Find the magnitude of electric field at a point 4cm away from a line charge of density $2 \times 10^{-6} \text{Cm}^{-1}$.	Knowledge	1
Q.2	A positive charge +Q is given one plate of parallel plate capacitor and -Q to other plate find the magnitude of the force with which positive plate attracts the negative plate.	Understanding	1
Q.3	Show that there can not be net charge in a region in which the electric field is uniform at all points.	Hot	1
SHORT ANSWER TYPE - I			
Q.4	Why two electric lines of forces never intersect each other ?	Knowledge	2
Q.5	Two charges are placed at a distance 1cm apart .What is the minimum possible magnitude of electric force acting on each charge ?	Understanding	2
Q.6	Two charged conducting spheres of radii a and b are connected to each other by a wire.What is the ratio of electric fields at the surface of the two sphere.Use the result obtained to explain why charge density on the sharp and pointed ends of a conductor is higher than on its flatter portion.	Logical	2
Q.7	What is the effect on drift velocity of electrons,if electric field is doubled at constant temperature.	Hot	2
SHORT ANSWER TYPE - II			
Q.8	Two metallic wires of the same material have the same length but cross sectional area in the ratio 1:2. They are connected (i) in series (ii)in parallel.Compare the drift velocities of electrons in the two wires in both the cases (i) and (ii).	Understanding	3
Q.9	Manish and Rajesh lived in an unauthorized colony. They found that most people of that colony stole power from transmission lines using hooks. They had read in the newspapers about different fire accidents caused due to electric short circuits. Along with some of their friends and some responsible representatives of that area, they visited homes to homes of that colony and made people aware of the risks involved in the short circuiting. They also explained the people the importance of paying electricity bills. They succeeded in changing the mindset of the people. Answer the following questions based on the above information; (a) What according to you, are the values of displayed by Manish and Rajesh? (b) A house hold circuit has a fuse of 5A rating. Find the maximum number of bulbs of rating 60W- 220V each which can be connected in this circuit.	Value based	3
Q.10	A parallel plate capacitor is charged by a battery, which is then	MultiConceptual	3

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	disconnected. A dielectric slab of dielectric constant K is then inserted in the space between the plate. Explain what changes, if any, occur in the values of: (i) capacitance (ii) potential difference between the plates (iii) electric field between the plates, and (iv) the energy stored in the capacitor.		
LONG ANSWER TYPE			
Q.11	(a) Derive an expression for the electric field E due to a dipole of length ' $2a$ ' at a point distant r from the centre of the dipole on the axial line. (b) Draw a graph of E versus r for $r \gg a$. (c) If this dipole were kept in a uniform external electric field E_0 , diagrammatically represent the position of the dipole in stable and unstable equilibrium and write the expression for the torque acting on the dipole in both the cases.	Logical	5
Q.12	(a) Use Gauss's theorem to find the electric field due to a uniformly charged infinitely large plane thin sheet with surface charge density σ . (b) An infinitely large thin plane sheet has a uniform surface charge density $+\sigma$. Obtain the expression for the amount of work done in bringing a point charge q from infinity to a point, distance r , in front of the charge plane sheet.	Hot	5