D.A.V. PUBLIC SCHOOL, KURUKSHETRA

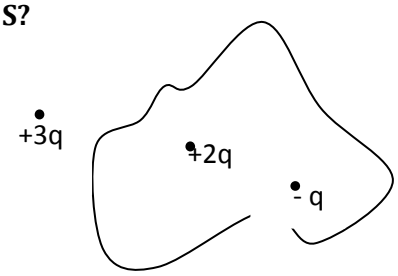
SUMMER VACATION ASSIGNMENT

CLASS - XII

SUBJECT – PHYSICS

Q. 1 An electrostatic field line cannot be discontinuous. Why?

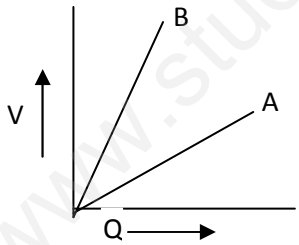
Q.2 Fig. shows three point charges +2q, -q and +3q. Two charges +2q and –q are enclosed within the surface 'S'. What is the electric flux due to this configuration through the surface S?



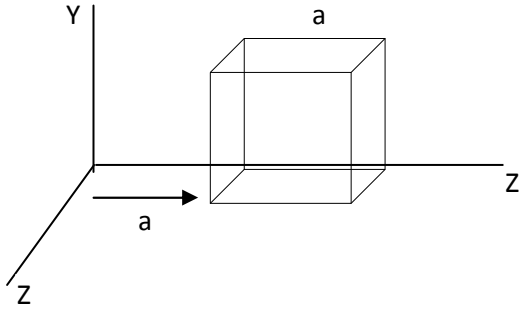
Q.3 A parallel plate capacitor is charged by a battery, which is then disconnected. A dielectric, state is then inserted in the space between the plates. Explain what changes, if any, occur in he values of

i. Capacitance
ii. Pot. Difference between the plates
iii. Electric field between the plates
iv. Energy stored in it.

Q.4 The graph shows variation of 'V' across plates of two capacitors A and B versus increase in energy 'Q' stored on them which of the two has higher capacitance & why?



Q.5 The electric field components are shown in fig. are $E_x = \propto \sqrt{x}$, $E_y = E_z = 0$ in which $\propto = 800 N/C\, m^{1/2}$. Calculate.
(a) electric flux thro' the cube
(b) change within the cube



Q. 6 An electric dipole of length 8cm ,when placed with its axes making an angle of 60° with a uniform electric field experiences a torque of $8\sqrt{3}$ N-m. Calculate –
(i) mag. Of electric field

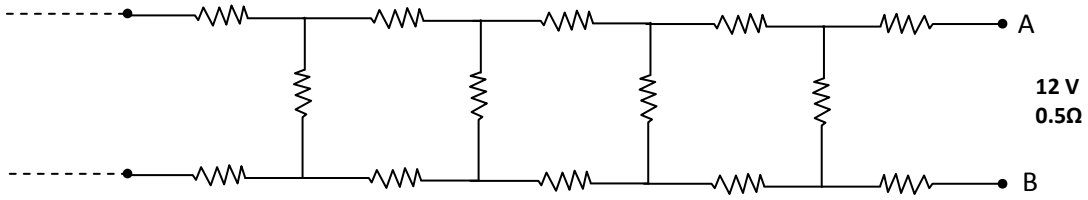
(ii) potential energy of dipole
If the dipole has charge $\pm 4\ n\ C$

Q.7 A cell of emf E and internal resistance 'r' is connected across an external resistance R. plot a graph showing the variation of P.D. across R Versus R.

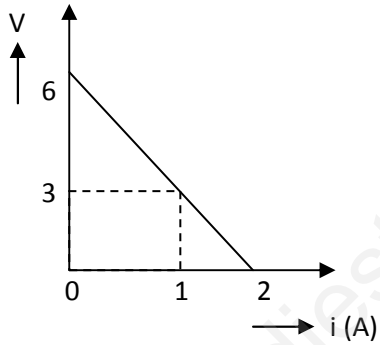
Q.8 Two wires X, Y have the same resistivity but their cross sectional areas are in the ratio 2:3 & lengths in the ratio 1:2. They are first connected in series and then in parallel to a dc source. Find the ratio of drift speeds of e^- in the two wires in the two cases.

Q.9 (a) Sate the principle of working of potentiometer.
(b) Draw a ckt diagram to compare emf of two primary cells. Write the formula used. How can the sensitivity of potentiometer be increased.

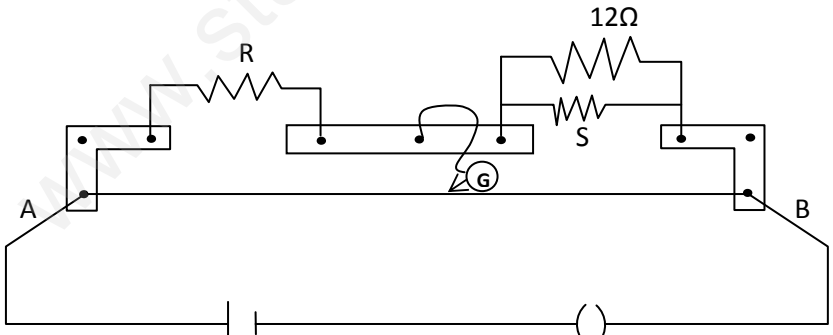
Q.10 Determine the current drawn from a 12V supply with internal Resistance 0.5Ω by the infinite network shown. Each resistor has 1Ω Resistance.



Q.11 The following graph shown in variation of V, across a combination of 3 cells in series to a resistor versus current i :
a) calculate the emf of each cell
b) for what current i, will the power dissipation of current be maximum?

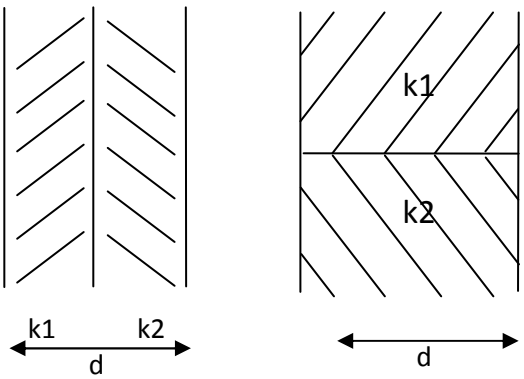


Q.12 In a meter bridge, the null pint is found a distance of 40cm from A. if a Resistance of 12Ω is connected in parallel with S, the null point occurs at 50cm from A. Determine R & S.



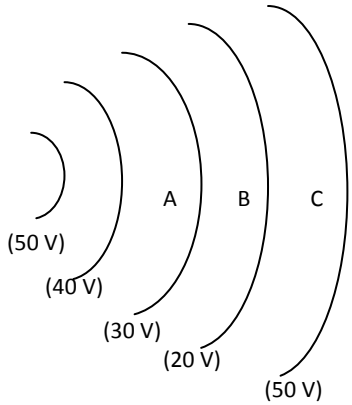
Q.13 Two charges q and -3q are placed fixed on x-axis separated by distance 'd'. Where should a third charge 2q be placed. So it does not experience any force?

Q.14 You are given an air filled capacitor C_1. The space between the plates is now filled with stabs of dielectric constants K1 and K2 as shown in C_2. Find the capacitances of C_2 if area of plates is A & distance between plates is d.



Q.15 **Find the expression for the electric field strength at a distance point situated.**
i) on the axis
ii) on the equatorial line of electric dipole.

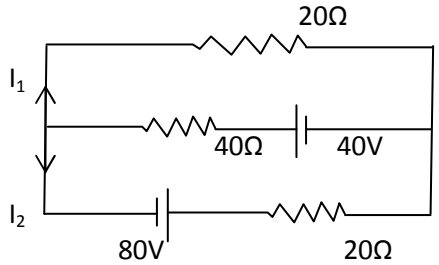
Q.16 **Fig. represents the electric lines of force at constant potentials. At which pt. A, B and C is the electric field**



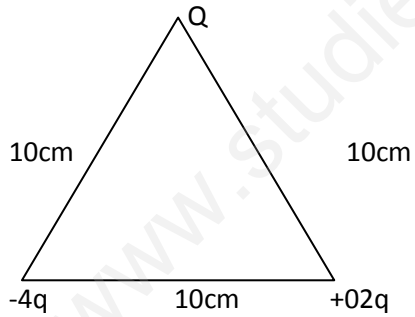
Q.17 **Derive condⁿ for balance of wheat stone bridge.**

Q.18 **Establish a relation between electric current and drift velocity.**

Q.19 **Use Kirchhoff's law to determine I_1.**



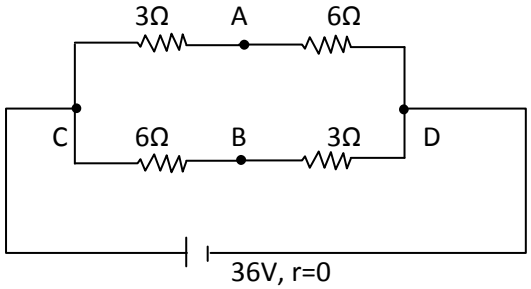
Q.20 **Calculate the work done to dissociate the system of there charges placed on the vertices of triang**



Q.21 **A heating element using nchrome is connected to a 230V supply draws on initial current of 3.2A which settles after a few seconds at a steady values of 2.8A. What is steady temp. of heating element if room temp. is 27°C? Temp. coefficient of resistance of nichrome averaged over temp. Range involved is 1.7 X 10^{-4} per °C .**

Q. 22 **Why do we prefer potentiometer to measure of a cell rather than a voltmeter?**

Q. 23 **Find the magnitude of current supplied by battery. Also find P.D. between A & B.**



Q. 24 **Find the condⁿ for max. current in external resistor connected to combination of cells in series.**

Q.25 **Draw a graph showing variation of Resistivity of**

a) metals
b) Semiconductors
c) Insulators
with temp.