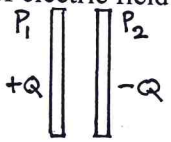
INDIAN SCHOOL NIZWA

PHYSICS WORKSHEET

CHAPTER 1 ELECTRIC CHARGES AND FIELD

DATE : NAME : CLASS XII

1. What does $q_1 + q_2 = 0$ signifies in electrostatics?
2. Can a body have a charge of 0.8×10^{-19} c? Justify your answer.
3. If the distance between two equal point charges is doubled and their individual charges are also doubled, what would happen to the force between them?
4. The electrostatic force between two charges is a central force. Why?
5. How does the force between two point charges change, if the dielectric constant of the medium in which they are kept, increases?
6. Force between two point charges kept at a distance d apart in air is F. If these charges are kept at same distance in water, how does the electric force between them change?
7. The dielectric constant of water is 80. What is its permittivity?
8. Why should a test charge be of negligibly small magnitude?
9. A charged particle is free to move in an electric field. Will it move always along an electric field?
10. Why do charges reside on the surface of a conductor?
11. Why is electric field zero inside a conductor?
12. Can electric field line form closed loops? Give reason.
13. Do electric field lines really exist? What is about the field they represent?
14. Draw lines of force to represent a uniform electric field.
15. An electric dipole free to move is placed in a uniform electric field. Explain with the help of a diagram its motion when it is placed, (a) parallel to the field (b) perpendicular to the field.
16. A spherical rubber balloon carries a charge that is uniformly distributed over its surface. As the balloon is blown up ; how does E vary for points (i) inside the balloon (ii) on the surface of the balloon (iii) outside the balloon.
17. A thin spherical shell carries a charge Q on its surface. A point charge Q/2 is placed at its centre O and another charge 2Q placed outside. If all the charges are positive, what will be the force on the charge at the centre?
18. Two large metal plates P_1 and P_2 , tightly held against each other and placed between two equal and unlike point charges perpendicular to the line joining them. (i) What will happen to the plates when they are released? (ii) Draw the pattern of electric field lines for the system.



19. A positive point charge (+q) is placed in the vicinity of an uncharged conducting plate. Sketch the electric field lines originating from the point charge on to the surface of the plate.
20. What is meant by the statement that electric field of a point charge has spherical symmetry whereas that of an electric dipole is cylindrical symmetry?
21. A charge q is placed at the centre of the line joining two equal charges Q. Show that the system of three charges will be in equilibrium if $q = Q/4$.
22. A sphere S_1 of radius r_1 encloses a charge Q. If there is another concentric sphere of radius r_2 ($r_2 > r_1$) and there be no additional charges between S_1 and S_2.
23. The dielectric constant of water is 80. What is its permittivity?
24. An electric dipole free to move is placed in a uniform electric field. Explain along with diagram its motion when it is placed, (a) parallel to the field (b) perpendicular to the field.
25. Five point charges, each of value +q coulomb are placed on five vertices of a regular hexagon of side L metres. Find the magnitude of force on a charge –q coulomb placed at the centre of the hexagon.

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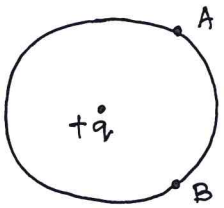
PHYSICS WORKSHEET

CHAPTER 2 ELECTROSTATIC POTENTIAL AND CAPACITANCE

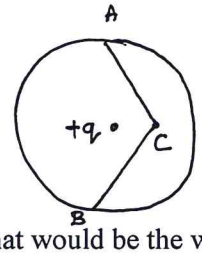
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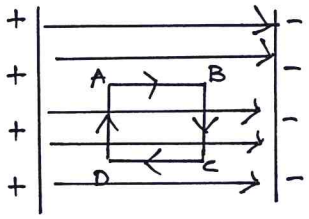
1. A parallel plate capacitor is charged by a battery which is then disconnected. A dielectric slab is then inserted to fill the space between the plates. Explain the changes if any in the values of (i) charge on the plates (ii) electric field between the plates (iii) p.d between the plates (iv) capacitance (v) energy stored in the capacitor.
2. Is the electrostatic potential necessarily be zero at a point where the electric field strength is zero?give an example to illustrate your answer.
3. In a certain $0.1m^3$ of space , electric potential is found to be 5v throughout. What is the electric field in this region?
4. What would be the work done if a point charge +q is taken from a point A to a point B on the circumference of a circle with another point charge +q at the centre?



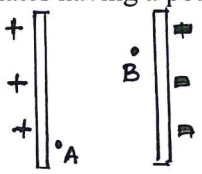
5. If a point charge +q is taken first from A to C and then from C to B of a circle drawn with another point charge +q as centre, then along which path more work will be done?



6. A uniform electric field E exist between two charged plates. What would be the work done to move a charge q along the closed path ABCDA?



7. Two protons A and B are placed between two parallel plates having a potential difference V, as shown. Will these protons experience equal or unequal force?

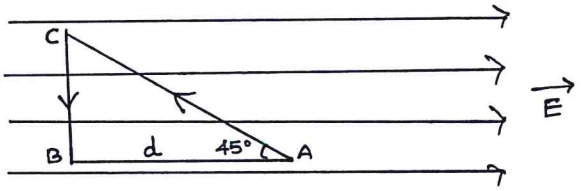


8. A point charge q is placed at O, as shown in figure. Is $V_A - V_B$ positive , negative or zero, if q is a (i) positive , (ii) negative charge?

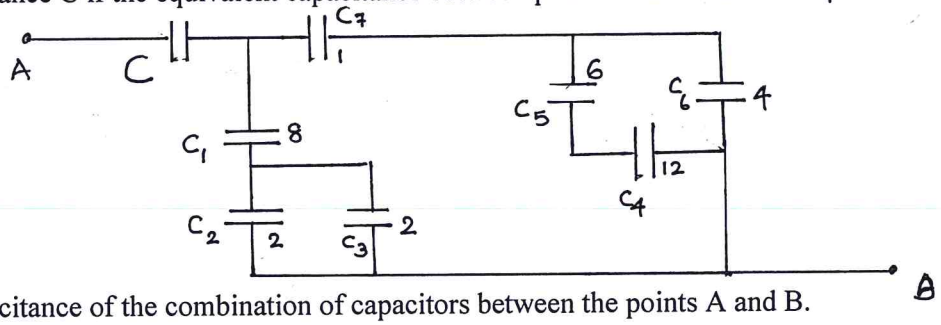


9. Why does the electric field inside a dielectric decrease when it is placed in an electric field?
10. The introduction of dielectric slab between the capacitor plates increases the capacitance. Why?
11. Is capacitance C of a capacitor proportional to charge Q?
12. Sketch a graph to show how charge Q acquired by a capacitor of capacitance C varies with the increase in potential difference between the plates.
13. Sketch a graph to show how the capacitance of a capacitor varies with charge Q given to it.
14. Define electric potential at a point. When kept in an electric field , does a proton moves from a lower potential to higher or vice versa?

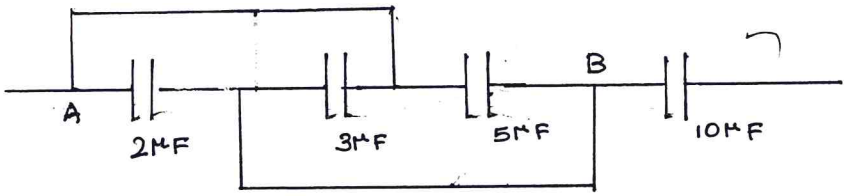
15. A test charge q_0 is moved without acceleration from A to B along path A to C to B, as shown. Calculate the potential difference between A and B?



16. Three capacitors of equivalent capacitance , when connected in series have net capacitance C_1 and when connected in parallel have net capacitance C_2. What is the value of C_1/ C_2?
17. Find the value of capacitance C if the equivalent capacitance between points A and B is to be 1μF. All the capacitances are in μF.



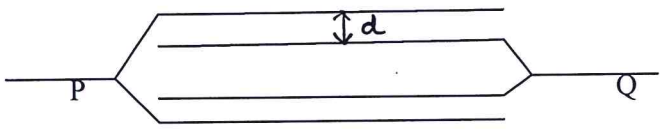
18. Find the equivalent capacitance of the combination of capacitors between the points A and B.



19. How much work must be done to charge a 24 μF capacitor when the potential difference between the plates is 500 V?
20. A capacitor is charged through a potential difference of 200v, when 0.1 C charge is stored in it. How much energy will it release, when it is discharged?

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21. What is the capacitance of the arrangement of four plates of area A at a distance d in air?



22. A point charge q move from a point P to a point S along the path PQRS in a uniform electric feld E acting along the positive direction of X axis. The co ordinates of the points P, Q, R and S are (a,b,0) , (2a, 0,0), (a, -b, 0) and (0,0,0) respectively. Find the work done by the field.
23. In the figure , the potentials at points A and B are V_A and V_B respectively. Calculate V_A and V_B for the given arrangement.
24. The two graphs drawn here, show the variation of electrostatic potential V with 1/r for two charges $q_1$and q_2. (i) What are the signs of the two charges? (ii) Which of the two charges has a larger magnitude and why?
25. Two identical plane metallic surfaces A and B are kept parallel to each other. In air, separated by a distance of 1cm. Surface A is given a positive potential of 10 V, ad the outer surface of B is earthed. (i) What is the direction and magnitude of uniform electric field between the points Y and Z? (ii) What is the work done in moving a charge of 20 μC from point X to Y?

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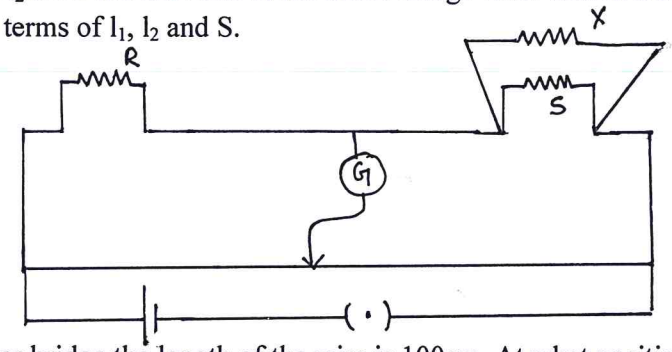
PHYSICS WORKSHEET

CHAPTER 3 CURRENT ELECTRICITY

DATE : NAME : CLASS XII

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1. When two known resistances R and S are connected in the left and right gap of a meter bridge , the balance point is found at a distance l_1 from the zero end of the meter bridge wire. An unknown resistance X is now connected in parallel to the resistance S and the balance point is now found at a distance l_2 from the zero end of the meter bridge wire. Obtain a formula for X in terms of l_1, l_2 and S.



2. In a meter bridge the length of the wire is 100cm. At what position will the balance point be obtained if the two resistances are in the ratio 2:3?
3. What do you mean by sensitivity of a meter bridge?
4. A potentiometer wire is 10m long and has a resistance of 18Ω. It is connected to a battery of emf 5v and internal resistance 2Ω. Calculate the potential gradient.
5. A potentiometer wire is supplied a constant voltage of 3V. A cell of emf 1.08 V is balanced by voltage drop across 216 cm of the wire. Find the total length of the wire.
6. What is meant by sensitivity of a potentiometer?
7. How can sensitivity of a potentiometer be increased?
8. Why a ten – wire potentiometer more sensitive than a four – wire potentiometer?
9. What are the advantages of Wheatstone bridge method of measuring resistance?
10. Draw a graph to show the variation of resistance of a metal wire as a function of its diameter, keeping length and temperature constant.
11. The current flowing through a conductor is 2mA at 50V and 3mA at 60 V. Is it an ohmic or non ohmic conductor?
12. Two wires of equal cross sectional area, one of copper and other of magnanin have the same resistance. Which one will be longer?
13. Why should we get the null point in the middle of the metre bridge wire?
14. A 10 m long wire of u uniform cross section of 20Ω resistance is used as a potentiometer wire. This wire is connected in series with a battery of 5V, along with an external resistance of 480Ω. If an unknown emf E is balanced at 600cm of this wire, calculate (i) the potential gradient of the potentiometer wire and (ii) the value of the unknown emf E.
15. A potential difference V is applied to a conductor of length l, diameter D. how are the electric field E , the drift velocity v_d and resistance R affected when (i) V is doubled (ii) l is doubled (iii) D is doubled?