

St. Crispin's Sr. Sec. School
Vacation Assignment (2020-21)

Class - XII

Subject – Physics

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. Students are required to do this assignment in their assignment notebook.

Q1. Draw an equipotential surface:

- (a) In a uniform electric field
- (b) For a point charge $q < 0$.

Q2. How will the capacitance of a capacitor change when a dielectric slab is introduced between the plates of a capacitor?

Q3. How does the resistivity of a conductor depend upon the number density of free electrons and temperature?

Q4. Show mathematically that the potential at a point on the equatorial line of an electric dipole is zero.

Q5. A hollow metal sphere of radius 5cm is charged such that the potential on its surface is 10V. What is the potential at the center of the sphere?

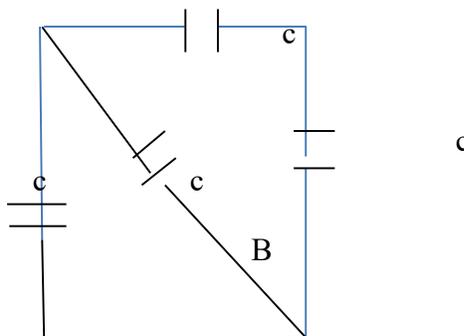
Q6. A charge of 12 C is given to hollow metallic sphere of radius 0.1m. Find the potential at (i) the surface of the sphere (ii) center of the sphere.

Q7. Calculate the Coulomb force between a proton and an electron separated by 0.8×10^{-15} m.

Q8 Calculate the Value of electric field exactly balancing the weight of an electron.

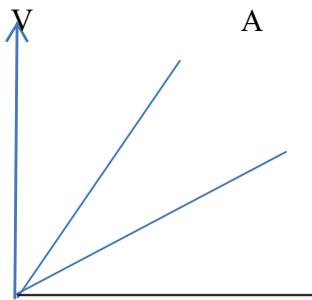
Q9. Two capacitors 3 farad & 6 farad are connected in series with a 6 V battery. Which one will have higher potential?

Q10. Calculate the net capacitance of the given network, if each capacitor is 5 microfarad.



Q11. If the plates of a charged capacitor are further separated while the capacitor is still connected to the charging battery, what will happen to the energy?

Q12 The V-I graph for two metals is shown below. Which one will have higher resistivity?



Q13. How does a torque affect the dipole in an electric field?

Q14. 27 drops of same size are charged at 220V each. They collapse to form a bigger drop. Calculate the potential of the bigger drop.

Q15. Draw a plot showing the variation of electric field & potential with distance due to a point charge.

Q16. A wire of resistance 5 ohm is drawn out so that its length is increased to twice its original length. Calculate its original resistance.

Q17. A lamp of 100 W works at 220 volt calculate its resistance & current capacity?

Q18. Why are thick copper wires used as connecting wire?

Q19. Why is the use of a potentiometer preferred over that of a voltmeter for measurement of E.M.F of a cell?

Q20. Define resistivity of the material of a wire. State its S.I. unit.

Q21. The storage battery of a car has an E.M.F. of 12 V. If the internal resistance of the battery is 0.4 ohm, what is the maximum current that can be drawn from the battery?

Q22. How will the magnetic field intensity at the centre of a circular loop carrying current change if the current through the loop is doubled and the radius of coil is halved?

Q23. An electron moving through a magnetic field does not experience any force. Under which condition is it possible?

Q24. Two wires of same material and of equal lengths are bent into the form of two loops. One of the loops is square while the other is circular. These are suspended in a uniform magnetic field and the same current is passed through them. Which loop will experience the maximum torque for the same orientation?

Q25. Two identical loops P and Q each of radius 5 cm are lying in perpendicular planes such that they have a common centre as shown in the figure. Find the magnitude and direction of the net magnetic field at the common centre of two coils, if they carry currents equal to 3A and 4 A respectively.

