# CLASS XII
GUESS PAPER
PHYSICS

ELECTROSTATIC

ONE MARKS QESTIONS

1) Why can one ignore quantization of charge when dealing with macroscopic charges?
2) Name the physical quantity whose SI unit is JC^{-1}. Is it a scalar or a vector quantity?
3) The distance of the field point on the axis of a small electric dipole is doubled. By what factor will the electric field due to the dipole change?
4) The electrostatic force between two charges is calculated by coulomb's law. Is this law is valid in all situations?
5) Two plane sheets of charge densities $+\sigma$ and $-\sigma$ are kept in air as shown in figure. What are the electric field intensities at point A and B.

$$\underline{\hspace{3cm} \bullet B \hspace{3cm}} \quad +\sigma$$

$$\underline{\hspace{3cm} \bullet A \hspace{3cm}} \quad -\sigma$$
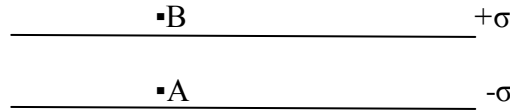
6) A Gaussian surface encloses an electric dipole within it. What is the total flux across sphere?
7) The given graph (x) shows that the variation of charge versus potential difference V for the two capacitors C_1 & C_2. The two capacitors have same plate separation but the plate area of C_2 is doubled than that of C_1. Which of the line in the graph corresponds to C_1 & C_2 and why?


(x)   **(y)**
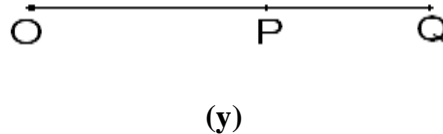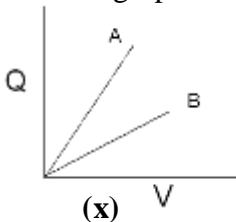
8) A point charge q is placed at O as shown in the figure Y. Is (V_P-V_Q) Positive or Negative when
   b) q>0, (ii) q<0?
9) A large hollow metallic sphere A is charged positively to a potential of 100V and a small sphere B to a potential of 50V. Now B is placed inside A and they are connected by a conducting wire. In which direction will the charge flow.
10) Define the physical quantity potential gradient. What does the sign indicate as involved?

TWO MARKS QUESTIONS

11) What is the number of electric field lines radiate outwards from one coulomb's of charge placed in vacuum?
12) What is the force between two small charged spheres having charges of $2x10^{-7}$C and $3x10^{-7}$C placed 30cm apart in air?

13) Figure shows the five charged lumps of plastic and a Cross section of Gaussian surface S. W hat is the net flux through the surface if;
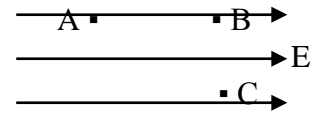$Q_1=Q_4= +3$ n C
$Q_2=Q_5= -5.9$ n C
$Q_3= -3.1$ n C
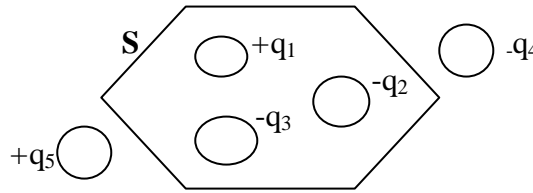
14) State any two basic properties of electric charge?

15) What is equipotential surfaces? Draw the two equipotential surfaces for uniform electric field?

OR

Three point s A,B and C lies in a uniform electric field (**E**) of 5×10^3 N/C as shown in the figure. Find the potential difference between the points A and C.

**THREE MARKS QUESTIONS**

16) Two charges each 2×10^{-7} C but opposite in sign forms a system. These charges are located at points A (0,0, -10) cm and B(0,0, +10) cm respectively. What is the total charge and electric dipole moment of the system?

17) A cylindrical Gaussian surface for an infinitely long straight wire of uniform linear charge densityis shown in the following figure; Answer the following.
   a) For which surface is the electric flux zero?
   b) Over which surface is **E** constant?
   c) Over which surface **E** zero
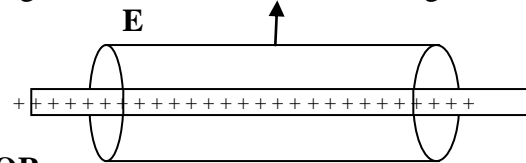
OR

Four charges each having charge 'q' are along x-axis at x=1 cm ,x=2 cm, x=4 cm, x=8 cm .Find the electric field at x=0 due to these charges.

18) Derive an expression for the energy stored in a parallel plate capacitor of capacitance C, charged to a potential difference V?

19) a) Find the equivalent capacitance of the following ladder between the point A and B in the following figure;
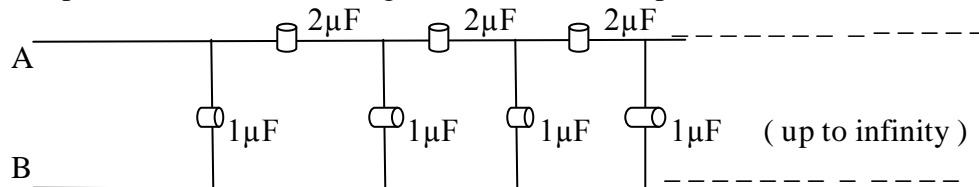
b) A parallel plate capacitor with air between the plates has a capacitance of 8 pF . The separation between the plates is now reduced by half and the space between them is filled with a medium of dielectric constant 5. Calculate the value of capacitance of parallel plate capacitor in second case.

20) An electric dipole is held in an uniform electric field. Using suitable diagram;

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a) show that it doesn't undergo any ranslator motion
b) Derive an expression for torque acting on it and specify its direction.

FIVE MARKS QUESTIONS

21) How charge given to inner sphere transfers to outer sphere? Name the device where it is used. Explain with diagram, working of that device.

OR

A thin conducting spherical shell of radius R has charge Q spread uniformly over its surface. Using Gauss's law, derive an expression for an electric field at a point.
Outside the shell   b) On the surface of shell   c) Inside the shell, Draw the graph of electric field E® from the centre of the shell for $0 \leq r \leq$ infinity .

22) Derive an expression for the potential energy of an electric dipole in a uniform electric field. Discuss the condition of stable equilibrium, unstable equilibrium and zero potential energy of the dipole.

OR

What is an electric field Intensity? Find an expression for electric field Intensity along the axial line of electric field. Give its SI unit.

23) What is an electric polarization of a dielectric? What is the effect on capacitance of a capacitor when a dielectric of width 't' is placed between the two plates of parallel plate capacitor?

OR

Electric field in the given figure is directed along + X direction and given by $E_x = 5Ax + 2B$, where E is in NC^{-1} and A = 10 and B = 5 in SI units. X is in meter. Calculate the electric flux through the cube and net charge enclosed within the cube. The side of the cube is 10cm.

For Solution Contact;
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