

ISCE – Class XII

PHYSICS



ELECTROSTATICS

QUESTION BANK

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TOPICS

- ✓ Electric Charges and Fields
- ✓ Gauss' Theorem
- ✓ Electric Potential and Potential Energy
- ✓ Capacitors and Dielectrics

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1. DEFINITIONS

Sr. No.	Question	Marks	Topic (s)
1.	Define capacitance of a conductor.	1	Capacitance
2.	Define Linear Charge distribution.	1	Charge distribution
3.	Define Surface charge distribution.	1	Charge distribution
4.	Define Volume charge distribution.	1	Charge distribution
5.	State Coulomb's formula for force of attraction or repulsion between two charges.	1	Coulomb's law
6.	State Coulomb's law in vector form.	1	Coulomb's law
7.	Is Coulomb's law true for nuclear and atomic distances?	1	Coulomb's law
8.	Define dielectric constant of a medium in terms of force between electric charges.	1	Dielectric constant
9.	Define the term 'moment of electric dipole'.	1	Electric Dipole
10.	Define electric field at a point in space due to a distribution of charges.	1	Electric field
11.	State the unit and dimensions of electric flux.	1	Electric flux
12.	Define electrostatic potential at a point. Is it a scalar or a vector?	1	Electric Potential
13.	Define potential between two points in an electric field.	1	Electric potential
14.	Define 'electron-volt'.	1	Electric Potential
15.	Define the unit 'steradian'.	1	Gauss' theorem
16.	Define the term 'electric line of force'.	1	Lines of Force



2. ANSWER IN BRIEF

Answer the following questions in brief. You may give an equation in support of your answer.

Sr. No.	Question	Marks	Topic (s)
1.	State the dimensions of capacitance.	1	Capacitance
2.	State the unit of capacitance. Define '1 Farad'.	1	Capacitance
3.	Three capacitors each of capacitance C are connected in series. What will be the equivalent capacitance? What will be the equivalent capacitance if they are connected in parallel?	1	Capacitance
4.	How is dielectric constant K expressed in terms of capacitance?	1	Capacitance
5.	What, if any, is the effect of temperature on the dielectric constant K of a dielectric?	1	Capacitance
6.	Two capacitors C_1 and C_2 are connected in parallel. If a charge Q is given to this system, in what ratio will it be distributed on them? Will the result change if the capacitors are connected in series?	1	Capacitance
7.	A PD of 250V exists across the plates of a $25 \mu\text{F}$ capacitor. Find the charge on each plate.	1	Capacitance
8.	Two capacitors C_1 and C_2 are given charges Q_1 and Q_2 and the charging battery is removed. They are then connected in parallel and a dielectric slab is inserted in C_2 . What will happen to (i) C_1 and C_2 , (ii) Q_1 and Q_2 ?	1	Capacitance
9.	Name a few dielectrics used in capacitors.	1	Capacitance
10.	Dielectric constant of water is 80. What is its permittivity?	1	Capacitance
11.	Define capacitance of a capacitor. What are the factors on which capacitance of a parallel plate capacitor depends.	2	Capacitance
12.	Can a charge of $8.7 \times 10^{-19} \text{ C}$ be given to a conductor? Why?	1	Charge quantization
13.	What is meant by quantization of charges?	1	Charge quantization
14.	Explain the meaning of the statement 'electric charge of a body is quantized'. Why can one ignore quantisation of electric charge when dealing with macroscopic i.e., large scale charges?	2	Charge quantization
15.	In Coulomb's law, on what factors the value of electrostatic force constant k depends?	1	Coulomb's law
16.	State Coulomb's law in vector form.	1	Coulomb's law
17.	State Coulomb's law in electrostatics. Mention two similarities and two differences between electrostatic and gravitational interactions.	1	Coulomb's law
18.	State the units and dimensions of ϵ_0 .	1	Coulomb's Law



19.	What additional information is obtained from the vector form of Coulomb's law?	1	Coulomb's Law	
20.	Define one coulomb. How many electrons will have a total charge of 1 coulomb?	2	Coulomb's Law	
21.	Is the mass of a body affected on charging?	1	Electric charge	
22.	Name the basic properties of an electric charge.	1	Electric Charge	
23.	Name the basic properties of electric charge	1	Electric charge	
24.	Two point-charges q_1 and q_2 are placed close to each other. What is the nature of the force between the charges when $q_1q_2 < 0$?	1	Electric charge	
25.	Two point-charges q_1 and q_2 are placed close to each other. What is the nature of the force between the charges when $q_1q_2 > 0$?	1	Electric charge	
26.	When a glass rod is rubbed with silk, it becomes positively charged. Explain why.	1	Electric charge	
27.	What is meant by elementary charge? What is its value?	1	Electric charge	
28.	State the units and dimensions of electric dipole.	1	Electric Dipole	
29.	What is an electric dipole? Give two examples.	1	Electric Dipole	
30.	Define the term 'electric field'. State the units of electric field.	1	Electric field	
31.	State the units and dimensions of electric field.	1	Electric field	
32.	A point-charge is placed at the origin. How does the electric field due to the charge vary with distance 'r' from the origin?	1	Electric field	
33.	Assuming the equation for electric field intensity due to a point charge, obtain the equation for electric field intensity due to a group of point charges.	1	Electric Intensity	Field
34.	State the equation for force on a charged particle in an electric field. Hence state the SI unit of electric field intensity. Obtain the dimension of electric field intensity.	2	Electric Intensity	Field
35.	Show that the electric field intensity at a point, due to a point charge, is inversely proportional to the square of its distance from the charge	2	Electric Intensity	Field
36.	How does the flux through spherical surface change if radius of the surface is doubled?	1	Electric flux	
37.	A, B and C are three charged bodies. If A and B repel each other, and A attracts C, what is the nature of force between B and C?	1	Electric force	
38.	Write down the relation between electric field and electric potential at a point.	1	Electric potential	
39.	Calculate the work done in taking an electron around a nucleus in a circular path.	1	Electric Potential	
40.	State the unit of electric potential in terms of the basic SI units.	1	Electric Potential	
41.	Can a charge of 1 C be given to a metallic sphere of radius 1 cm? Why?	1	Electric potential	



42.	If the electric field intensity at a point is zero, will the electric potential at the same point necessarily be zero?	1	Electric Potential
43.	Several identical charges (all positive or all negative) have to be arranged so that the electric field and electric potential are both zero at a point. Is this possible? Explain why.	1	Electric Potential
44.	Define 'electric potential energy of a system of charges'. State its SI unit.	1	Electric Potential
45.	What will be the nature of electric potential at a point where the electric field is zero?	1	Electric Potential
46.	What is a conservative field? Give one example.	1	Electric Potential
47.	Potential at a point in an electric field is arbitrary. Explain why?	1	Electric Potential
48.	Electrostatic force between two charges is called central force. Why?	1	Electrostatic force
49.	A Gaussian surface is chosen to obtain an expression for the electric field at a point due to a given charge configuration. It is a closed surface. State one essential property of such a closed surface.	1	Gauss' Theorem
50.	The unit of electric field E is volt/metre. Obtain the unit of electric flux.	1	Gauss' Theorem
51.	If Coulomb's law involved $1/r^3$ dependence instead of $1/r^2$, would Gauss' law be still valid?	1	Gauss' Theorem
52.	State Gauss theorem in electrostatics. Is electric flux a scalar or a vector? Give its SI unit.	2	Gauss' theorem
53.	An electrostatic field line is a continuous curve. That is, a field line cannot have sudden breaks. Why not?	1	Lines of force
54.	Why do electric lines of force never intersect each other.	1	Lines of force
55.	Why do the electrostatic field lines not form closed loops?	1	Lines of force
56.	Define electric lines of force and give their two important properties.	2	Lines of force
57.	State the relation between relative permeability and absolute permeability of a dielectric medium.	1	Permeability
58.	State the units of electric permittivity in SI units.	1	Permittivity
59.	Write down the value of absolute permittivity of free space.	1	Permittivity
60.	State the principle of superposition of forces in electrostatics	1	Superposition princ.



3. SHORT ANSWERS

Answer the following questions to the point. You may draw a diagram and give relevant equations in support of your answer.

Sr. No.	Question	Marks	Keyword(s)
1.	How can we increase the capacitance of a parallel plate capacitor?	1	Capacitance
2.	When a medium of dielectric constant K is introduced between the plates of a parallel-plate capacitor, how do the (i) capacitance, (ii) PD between the plates change?	2	Capacitance
3.	Write formulae for the equivalent capacitance of a (i) series combination, (ii) parallel combination of capacitances $C_1, C_2, C_3, \dots, C_n$.	2	Capacitance
4.	A parallel plate capacitor is charged by a battery; which is then disconnected. A dielectric slab is now introduced between the two plates to occupy the space completely. State the effect on the following: (i) the capacitance of the capacitor. (ii) potential difference between the plates. (iii) the energy stored in the capacitor.	3	Capacitance
5.	What is a capacitor? Define 'capacitance' of a capacitor. State the factors on which the capacitance depends.	3	Capacitance
6.	What is a dielectric? What is its unit? Define the dielectric constant of a material.	3	Capacitance
7.	Obtain an expression for the capacitance of an isolated spherical conductor.	3	Capacitance.
8.	State and explain the law of conservation of charges.	2	Conservation of Electric Charge
9.	Give two examples that support the law of conservation of charges.	2	Conservation of Electric Charge
10.	Compare Coulomb force and gravitational force. If the distance between two, point charges are doubled, what would happen to the electrical force between them?	3	Coulomb force, Gravitational force
11.	How many electrons must be removed from a conductor, so that it acquires a charge of 3.5nC ?	1	Electric charge
12.	How much positive and negative charge is there in a cup of water?	2	Electric charges
13.	Define electric flux and electric flux density. With the help of a diagram, explain what is meant by negative flux? State the SI unit and dimension of electric flux.	3	Electric Flux
14.	Define electric flux. Write its SI unit. Explain area as a vector quantity and relate it to the electric flux passing through an area A of a Gaussian surface.	5	Electric flux



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| 15. | State the important properties of equipotential surfaces. | 2 | Electric Potential |
| 16. | What is an equipotential surface? Draw the same for a point charge. Show that the electric field is always directed perpendicular to an equipotential surface. | 3 | Electric Potential |
| 17. | Explain why electric lines of force are perpendicular to equipotential surface. Why two equipotential surfaces never intersect? | 3 | Electric Potential |
| 18. | What do you understand by a Gaussian surface? Is it always a closed surface? Derive Coulomb's law by using Gauss' law. | 5 | Gauss' Theorem |
| 19. | State the properties of lines of force. | 3 | Lines of force |
| 20. | State and explain the principle of superposition as applied to electrostatic forces on a charge due to a number of charges. | 2 | Superposition principle |



4. DIAGRAMS

For each of the following questions, draw neat labelled diagrams.

Sr. No.	Question	Marks	Keyword(s)
1.	Depict the electric field lines due to two positive charges kept a certain distance apart.	1	Lines of force
2.	Sketch the electric lines of force for isolated positive and negative test charges.	1	Lines of force
3.	Plot a graph showing the variation of Coulomb force (F) versus $(1/r^2)$, where r is the distance between the two charges of each pair of charges: $(1\mu\text{C}, 2\mu\text{C})$ and $(2\mu\text{C}, -3\mu\text{C})$. Interpret the graphs obtained.	2	Coulomb force
4.	Draw equipotential surfaces due to a point charge $Q > 0$. Are these surfaces equidistant from each other? If not, explain why.	2	Equipotential surfaces
5.	Draw a diagram illustrating the various forces acting on an electric dipole kept in an electric field	1	Electric Dipole
6.	Draw a graph showing the variation of electric field as one moves from the centre of a charged metal ball to a point on its surface and then to a far-off outside point.	2	Gauss' Theorem
7.	Using Gauss' law, show that an electric field does not exist inside a charged conductor.	2	Gauss' Theorem
8.	Show that the electric potential at a point P, at a distance r from a fixed point charge Q is given by $V = \frac{Q}{4\pi\epsilon_0 r}$	3	Electric Potential
9.	Show graphically, the variation of electric field and electric potential with distance.	1	Electric Potential
10.	Draw a neat diagram showing three capacitors connected in series. Indicate the charges and voltages for each capacitor.	1	Capacitance
11.	Draw a neat diagram showing three capacitors connected in parallel. Indicate the charges and voltages for each capacitor.	1	Capacitance



5. DERIVATIONS

All derivations must be explained with neat labelled diagrams.

Sr. No.	Question	Marks	Keyword(s)
1.	Obtain an expression for the capacitance of a parallel-plate capacitor with dielectric slab between the plates.	5	Capacitance
2.	Show that, if several capacitors are connected in series, then the reciprocal of the capacitance of the equivalent capacitor is equal to the sum of the reciprocals of the capacitances of the individual capacitors.	5	Capacitance
3.	Derive the equation for the energy stored by a charged capacitor.	5	Capacitance
4.	Derive the equation for the energy stored by a charged capacitor C charged to a potential V. Hence obtain the equation for the energy stored in (i) a series combination of capacitors, (ii) a parallel combination of capacitors.	5	Capacitance
5.	If several capacitors are connected in parallel, obtain an expression for the equivalent capacitance.	5	Capacitance
6.	What do you mean by sharing of charges? Obtain an expression for energy loss when two parallel plate capacitors are connected in parallel.	5	Capacitance
7.	What is a dielectric? A dielectric slab of thickness t is kept between the plates of a parallel-plate capacitor separated by a distance d . Derive expression for capacitance for $t < d$.	5	Capacitance
8.	Derive an expression for the energy stored in a charged parallel-plate air capacitor. How does the energy stored change when the medium of air between the plates is replaced by a medium of dielectric constant K ?	5	Capacitance
9.	Derive an expression for the potential energy of a charged conductor.	3	Capacitance.
10.	Derive an expression for the capacitance of a parallel-plate capacitor. How can the capacitance be increased?	5	Capacitance.
11.	Obtain an expression for the intensity of electric field at a point on the axial position of an electric dipole.	3	Electric dipole
12.	Obtain an expression for electric field intensity E at any point on the equatorial line of an electric dipole	3	Electric dipole
13.	Define the term electric dipole moment. Is it a scalar or a vector? Deduce an expression for the electric field at a point on the equatorial plane of an electric dipole of length $2a$	3	Electric dipole
14.	Derive an expression for the torque experienced by an electric dipole kept in a uniform electric field. Write the pair of vectors perpendicular to each other.	3	Electric dipole
15.	Show that the electrical field intensity due to a short dipole at a distance r along its axis is twice the intensity at the same distance along the equatorial axis.	5	Electric dipole
16.	Draw a labelled diagram showing an electric dipole making an angle with	5	Electric dipole



	a uniform electric field E . Derive an expression for the torque experienced by the dipole.		
17.	Show that the electric field intensity on an axial point is double in magnitude but opposite in direction, than the intensity at the same distance on the equatorial line.	5	Electric Dipole
18.	Derive an expression for the intensity of electric field at a point at a distance ' r ' from a point charge ' q '.	2	Electric field
19.	Using Gauss theorem, obtain the expression for the electric field due to uniformly charged linear conductor.	3	Electric field – linear conductor
20.	Using Gauss theorem, obtain the expression for the electric field due to uniformly charged thin sheet of charge.	3	Electric field – plane
21.	Using Gauss theorem, obtain the expression for the electric field due to uniformly charged thin spherical shell of radius R at a point outside the shell. Draw a graph showing the variation of electric field with r , for $r > R$ and $r < R$.	3	Electric field – spherical shell
22.	Obtain an expression for electric potential ' V ' due to a point charge ' Q ' at a distance r .	3	Electric Potential
23.	Establish the relation between electric field and electric potential at a point.	3	Electric potential
24.	What is meant by the electric potential energy of two point-charges separated by a finite distance? Obtain an expression for it. What would happen to the electric potential energy if the distance is reduced between two similar and opposite charges?	5	Electric Potential
25.	Derive an expression for the electric potential at a point on the axis of an electric dipole.	5	Electric Potential
26.	Derive an expression for the electric potential at a point on the equatorial line of an electric dipole.	5	Electric Potential
27.	Obtain an expression for the electric potential at any point near an electric dipole. Hence, obtain the electric potential at (i) an axial point and (ii) on the equatorial line. Also express this in vector form.	5	Electric Potential
28.	State and prove Gauss' Theorem.	3	Gauss Theorem
29.	Obtain an expression for the electric field due to an infinite line of charge by applying Gauss theorem.	3	Gauss Theorem
30.	Derive an expression for the electric field at a distance r from an infinite plane sheet of charge.	3	Gauss' Theorem
31.	Two infinite, plane sheets of positive charge are placed parallel to each other in vacuum. Derive the expression for the electric field at a point in between the sheets.	3	Gauss' Theorem
32.	State the essential properties of Gaussian surface.	2	Gaussian Surface



6. NUMERICAL PROBLEMS

All numerical problems must be solved by first stating the equations used, and final answer must have proper units.

Sr. No.	Question	Marks	Keyword(s)
1.	A 12 pF capacitor is connected to a 50 V battery. How much electrostatic energy is stored in the capacitor?	1	Capacitance
2.	Assuming the Earth as an insulated spherical conductor of radius 6400 km, calculate its capacitance.	1	Capacitance
3.	A 1 μf (C_1) and a 2 μF (C_2) capacitor can separately withstand maximum voltages of 6 kV and 4 kV respectively. What maximum voltage will the system C_1 and C_2 withstand if they are connected in series?	3	Capacitance
4.	You are provided with 8 μF capacitors. Show, with the help of a diagram, how you will arrange minimum number of them to get a resultant capacitance of 20 μF .	3	Capacitance
5.	Three capacitors each of capacitance C are connected in series. Their equivalent capacitance is C_s . The same three capacitors are now connected in parallel. Their equivalent capacitance is C_p . Find the ratio C_p/C_s .	3	Capacitance
6.	Three capacitors each of capacitance 18 pF are connected in series. (a) What is the total capacitance of the combination? What is the potential difference across each capacitor if the combination is connected to a 100 V supply?	3	Capacitance.
7.	Calculate the Coulomb's force between a proton and electron separated by 0.8×10^{-15} m.	2	Coulomb's force
8.	If the distance between two equal point charges is doubled and their individual charges are halved, what would happen to the force between them?	2	Coulomb's force
9.	Three point-charges $+2\mu\text{C}$ $-3\mu\text{C}$ and $-3\mu\text{C}$ are placed at the three vertices A, B and C of an equilateral triangle, of side 0.2 m. What should be the sign and magnitude of a charge to be placed at the mid-point M of side BC so that the charge at point A remains in equilibrium?	3	Coulomb's Law
10.	Force between two charges kept in air is F . What is the force between the same charges kept in water with same separation if the dielectric constant of water is 80?	2	Dielectric constant
11.	Check that the ratio $ke^2/G m_e m_p$ is dimensionless. Look up a Table of Physical Constants and determine the value of this ratio. What does the ratio signify?	2	Electric and Gravitational forces
12.	Calculate number of protons in 1 coulomb of charge.	1	Electric charge
13.	What is the amount of charge possessed by 1kg of electrons? Given that mass of an electron is 9.1×10^{-31} kg.	2	Electric charge



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| 14. | Which is bigger, a coulomb or charge on an electron? How many electronic charge form one coulomb of charge? | 2 | Electric charge |
| 15. | Two equal point charges $Q = +\sqrt{2} \mu\text{C}$ are placed at each of the two opposite corners of a square, and equal point charges q at each of the other two corners. What must be the value of q so that the resultant force on Q is zero? | 2 | Electric charge |
| 16. | A charged oil drop weighing $1.6 \times 10^{-15} \text{ N}$ is found to remain suspended in a uniform electric field of intensity of intensity $2 \times 10^3 \text{ N/C}$. Find the charge on the oil drop. | 2 | Electric charge |
| 17. | A polythene piece rubbed with wool is found to have a negative charge of $3 \times 10^{-7} \text{ C}$. | 3 | Electric charge |
| | (i) Estimate the number of electrons transferred (from which to which?) | | |
| | (ii) (ii) Is there a transfer of mass from wool to polythene? | | |
| 18. | Two electric charges q and $2q$ are placed at a distance 'r' apart from each other in air. A third charge Q is to be placed along the same line in such a way that the net force acting at q and also at $2q$ is zero. Calculate the position of charge Q in terms of q and $2q$. | 3 | Electric charge |
| 19. | An electric dipole with dipole moment $4 \times 10^{-9} \text{ Cm}$ is aligned at 30° with the direction of a uniform electric field of magnitude $5 \times 10^4 \text{ N/C}$. Calculate the magnitude of the torque acting on the dipole. | 2 | Electric dipole |
| 20. | A system has two charges $q_A = 2.5 \times 10^{-7} \text{ C}$ and $q_B = -2.5 \times 10^{-7} \text{ C}$ located at points A (0, 0, -15 cm) and B (0, 0, + 15 cm), respectively. What is the total charge and electric dipole moment of the system? | 3 | Electric dipole |
| 21. | Calculate the electric field strength required to just support a water drop of mass 10^{-7} kg and having a charge $1.6 \times 10^{-19} \text{ C}$. | 2 | Electric field |
| 22. | Two point-charges of $+16 \mu\text{C}$ and $-9 \mu\text{C}$ are placed 8 cm apart in air. Determine the position of the point at which the resultant field is zero. | 2 | Electric field |
| 23. | Four charges $+q, +q, -q, -q$ are placed respectively at the four corners of a square of side a . Find the magnitude and direction of the electric field at the center of the square. | 3 | Electric field |
| 24. | A charge q is placed at the centre of a cube of side l . What is the electric flux passing through each face of the cube? | 2 | Electric flux |
| 25. | A point charge of 10^{-7} C is situated at the center of a cube of 1 m side. Calculate the electric flux through its surface. | 2 | Electric flux |
| 26. | Find the electric flux through each face of a hollow cube of side 10 cm, if a charge of $8.854 \mu\text{C}$ is placed at its center. | 2 | Electric flux |
| 27. | What will be the net electric force acting on an electric dipole placed in a uniform electric field? | 1 | Electric force |
| 28. | What is the force between two small charged spheres having charges of $2 \times 10^{-7} \text{ C}$ and $3 \times 10^{-7} \text{ C}$ placed 30 cm apart in air? | 2 | Electric force |
| 29. | The electrostatic force on a small sphere of charge $0.4 \mu\text{C}$ due to another small sphere of charge $-0.8 \mu\text{C}$ in the air is 0.2 N . | 2 | Electric force |
| | (a) What is the distance between the two spheres? | | |
| | (b) What is the force on the second sphere due to the first? | | |



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| 30. | Point charges $2\mu\text{C}$, $-5\mu\text{C}$, $2\mu\text{C}$ and $5\mu\text{C}$ are located at the four corners of a square ABCD of side 10 cm, respectively. What is the force on a charge of $1\mu\text{C}$ placed at the center of the square? | 3 | Electric force |
| 31. | Two point-charges $q_A = 3\mu\text{C}$ and $q_B = -3\mu\text{C}$ are located 20 cm apart in a vacuum.
(i) What is the electric field at the midpoint O of the line AB joining the two charges?
(ii) If a negative test charge of magnitude $1.5 \times 10^{-9}\text{C}$ is placed at this point, what is the force experienced by the test charge? | 3 | Electric force |
| 32. | Calculate the electric potential at a point P due to a charge $5 \times 10^{-7}\text{C}$, located 9 cm away. Hence, calculate the work done in bringing a charge of $2 \times 10^{-9}\text{C}$ from infinity to point P. Does the answer depend on the path along which the charge is brought? | 3 | Electric Potential |
| 33. | Two point-charges $-0.06\mu\text{C}$ and $0.12\mu\text{C}$ are situated at a distance of 3.0 m away from each other. What is the electric field and potential at a point midway between them? How much work must be done in bringing a charge of $0.2\mu\text{C}$ from infinity to the midpoint P? | 3 | Electric Potential |
| 34. | Two point-charges $3 \times 10^{-8}\text{C}$ and $-2 \times 10^{-8}\text{C}$ are kept 15 cm apart. At what point on the line joining the two charges is the electric potential zero? | 3 | Electric Potential |
| 35. | Four point-charges each of charge $-q$ are situated at the corners of a square of side 'a'. A charge $+4q$ is situated at the intersection P of the two diagonals of the square. Calculate the work required to be done to move the charge $+4q$ from point P to infinity. | 3 | Electric Potential |
| 36. | Two point-charges of $10\mu\text{C}$ each are placed at a distance of 3m in vacuum. Calculate their electrostatic potential energy. | 1 | Electrostatic Potential |
| 37. | Point charges of $25\mu\text{C}$, $50\mu\text{C}$ and $100\mu\text{C}$ are kept at the corners A, B, and C respectively of an equilateral triangle ABC having each side equal to 7.5 m. What is the total electrostatic potential energy of the system? | 3 | Electrostatic Potential |
| 38. | A large hollow metallic sphere has a positive charge of $35.4\mu\text{C}$ at its centre. How much electric flux emanates from its surface? | 1 | Gauss' Theorem |
| 39. | Calculate electric intensity at a point outside the uniformly charged thin infinite plane sheet of surface charge density $3.29 \times 10^{-20}\text{C/m}^2$. | 1 | Gauss' Theorem |
| 40. | An infinite line charge produces a field of $9 \times 10^4\text{N/C}$ at a distance of 2 cm. Calculate the linear charge density. | 2 | Linear charge density |

