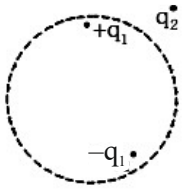
PHYSICS

ELECTROSTATICS

21. Consider the charge configuration and a spherical Gaussian surface as shown in the figure. When calculating the flux of the electric field over the spherical surface, the electric field will be due to

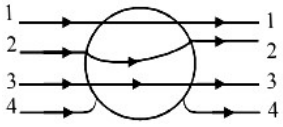


(1) q_2
(2) only the positive charges
(3) all the charges
(4) $+q_1$ and $-q_1$

22. A hollow metal sphere of radius 5 cm is charged such that the potential on its surface is 10 V. The potential at the centre of the sphere is
(1) zero
(2) 10 V
(3) same as at a point 5 cm away from the surface
(4) same as at a point 25 cm away from the surface

23. In bringing an electron towards another electron, the electrostatic potential energy of the system
(1) becomes zero
(2) increases
(3) decreases
(4) remains same

24. A metallic solid sphere is placed in a uniform electric field. The lines of force follow the path(s) shown in the figure as



(1) 1 (2) 2
(3) 3 (4) 4

25. Some charge is being given to a conductor. Then its potential is
(1) maximum at surface
(2) maximum at centre
(3) remain same throughout the conductor
(4) maximum somewhere between surface and centre

26. Two charges q_1 and q_2 are r distance apart. The ratio of electrostatic forces acting on them will be
(1) $q_1 : q_2$ (2) $q_2 : q_1$
(3) $q_1^2 : q_2^2$ (4) 1 : 1

27. An electric dipole of dipole moment p is enclosed in a hollow sphere of radius R ($R > l$), where l is length of dipole. The flux through the sphere is
(1) zero (2) $4\pi R^2 \times \rho$
(3) $\frac{p_0}{I\varepsilon_0}$ (4) $\frac{p}{2I\varepsilon_0}$

28. The angle between the electric dipole moment and the electric field strength due to it on the axial line is
(1) 0° (2) 90°
(3) 270° (4) 180°

29. The net torque acting on dipole placed in uniform electric field may be (symbols have usual meaning)
(1) zero (2) $\frac{pE}{2}$
(3) pE (4) all of these

30. The force between two short electric dipoles separated by a distance r is directly proportional to
(1) r (2) r^2
(3) $\frac{1}{r^3}$ (4) $\frac{1}{r^4}$