**ELECTRIC DIPOLE**

1. An electric dipole when placed in a uniform electric field  will have minimum potential energy, if the positive direction of dipole moment makes the following angle with 

(a)  (b) 

(c) Zero (d) 

1. A given charge is situated at a certain distance from an electric dipole in the end-on position experiences a force F. If the distance of the charge is doubled, the force acting on the charge will be

(a) 2*F* (b) *F* / 2

(c) *F* / 4 (d) *F* / 8

1. The electric potential at a point on the axis of an electric dipole depends on the distance  of the point from the dipole as

(a)  (b) 

(c)  (d) 

1. An electric dipole of moment  is placed in the position of stable equilibrium in uniform electric field of intensity . It is rotated through an angle  from the initial position. The potential energy of electric dipole in the final position is (a) (b) 

(c) (d) 

1. An electric dipole is kept in non-uniform electric field. It experiences

(a) A force and a torque (b) A force but not a torque

(c) A torque but not a force (d) Neither a force nor a torque

1. An electric dipole consisting of two opposite charges of  each separated by a distance of  is placed in an electric field of  *N*/*C*. The maximum torque on the dipole will be

(a)  (b) 

(c)  (d) 

1. An electric dipole of moment  is placed normal to the lines of force of electric intensity , then the work done in deflecting it through an angle of  is

(a)  (b) 

(c)  (d) Zero

1. The distance between the two charges  and  of a dipole is . On the axial line at a distance  from the centre of dipole, the intensity is proportional to

(a)  (b) 

(c)  (d) 

1. An electron and a proton are at a distance of . The moment of this dipole will be (*C* × *m*)

(a)  (b) 

(c)  (d) 

1. The electric field due to a dipole at a distance on its axis is

(a) Directly proportional to 

(b) Inversely proportional to 

(c) Directly proportional to 

(d) Inversely proportional to 

1. Two charges and  placed at  apart form an electric dipole. It is placed in a uniform electric field of intensity . The electric dipole moment is

(a) 

(b) 

(c) 

(d) 

1. An electric dipole of moment is placed at the origin along the -axis. The electric field at a point , whose position vector makes an anglewith the -axis, will make an angle ..... with the -axis, where 

(a)  (b) 

(c)  (d) 

1. An electric dipole is placed along the axis at the origin . A point  is at a distance of  from this origin such that  makes an angle  with the *x-*axis. If the electric field at  makes an angle  with the *x*-axis, the value of  would be

(a)  (b) 

(c)  (d) 

1. Electric charges  are placed at the corners of an equilateral triangle  of side . The magnitude of electric dipole moment of the system is

(a)  (b) 

(c)  (d) 

1. The torque acting on a dipole of moment  in an electric field  is

(a)  (b) 

(c) Zero (d) 

1. The electric field at a point on equatorial line of a dipole and direction of the dipole moment

(a) Will be parallel

(b) Will be in opposite direction

(c) Will be perpendicular

(d) Are not related

1. Two opposite and equal charges  when placed  away, form a dipole. If this dipole is placed in an external electric field , the value of maximum torque and the work done in rotating it through  will be

(a)  and 

(b) *Nm* and 

(c)  and 

(d)  and 

1. If  be the electric field strength of a short dipole at a point on its axial line and  that on the equatorial line at the same distance, then

(a)  (b) 

(c)  (d) None of the above

1. An electric dipole is placed in an electric field generated by a point charge

(a) The net electric force on the dipole must be zero

(b) The net electric force on the dipole may be zero

(c) The torque on the dipole due to the field must be zero

(d) The torque on the dipole due to the field may be zero

1. A point  lies on the perpendicular bisector of an electrical dipole of dipole moment . If the distance of  from the dipole is  (much larger than the size of the dipole), then electric field at  is proportional to

(a)  and  (b)  and 

(c)  and  (d)  and 

1. If the magnitude of intensity of electric field at a distance  on axial line and at a distance  on equatorial line on a given dipole are equal, then  is

(a)  (b) 

(c)  (d) 

1. An electric dipole in a uniform electric field experiences (When it is placed at an angle  with the field)

(a) Force and torque both (b) Force but no torque

(c) Torque but no force (d) No force and no torque

1. The electric intensity due to a dipole of length 10 *cm* and having a charge of , at a point on the axis at a distance 20 *cm* from one of the charges in air, is

(a)  *N*/*C* (b)  *N*/*C*

(c)  *N*/*C* (d)  *N*/*C*

1. Electric potential at an equatorial point of a small dipole with dipole moment (*r*, distance from the dipole) is

(a) Zero (b) 

(c)  (d) 

1. The distance between  and  ions in *HCl* molecule is 1.28 Å. What will be the potential due to this dipole at a distance of 12 Å on the axis of dipole

(a) 0.13 *V* (b) 1.3 *V*

(c) 13 *V* (d) 130 *V*

1. The potential at a point due to an electric dipole will be maximum and minimum when the angles between the axis of the dipole and the line joining the point to the dipole are respectively

(a)  and  (b)  and 

(c)  and  (d)  and 

1. The value of electric potential at any point due to any electric dipole is

(a)  (b) 

(c)  (d) 

1. An electric dipole has the magnitude of its charge as *q* and its dipole moment is *p*. It is placed in a uniform electric field *E*. If its dipole moment is along the direction of the field, the force on it and its potential energy are respectively

(a)  and minimum (b)  and 

(c) Zero and minimum (d)  and maximum

1. Intensity of an electric field *E* due to a dipole, depends on distance *r* as

(a)  (b) 

(c)  (d) 

1. The ratio of electric fields on the axis and at equator of an electric dipole will be

(a) 1 : 1 (b) 2 : 1

(c) 4 : 1 (d) None of these

1. For a dipole  and . Calculate the maximum torque for this dipole if 

(a)  (b) 

(c)  (d) 

1. A molecule with a dipole moment *p* is placed in an electric field of strength *E*. Initially the dipole is aligned parallel to the field. If the dipole is to be rotated to be anti-parallel to the field, the work required to be done by an external agency is

(a) – 2*pE* (b) – *pE*

(c) *pE* (d) 2*pE*

1. An electric dipole of moment  placed in a uniform electric field  has minimum potential energy when the angle between  and  is

(a) Zero (b) 

(c)  (d) 

1. A region surrounding a stationary electric dipoles has

(a) Magnetic field only

(b) Electric field only

(c) Both electric and magnetic fields

(d) No electric and magnetic fields

1. Two electric dipoles of moment *P* and 64 *P* are placed in opposite direction on a line at a distance of 25 *cm*. The electric field will be zero at point between the dipoles whose distance from the dipole of moment *P* is

(a) 5 *cm* (b) *cm*

(c) 10 *cm* (d)  *cm*

1. When an electric dipole  is placed in a uniform electric field  then at what angle between  and  the value of torque will be maximum

(a)  (b) 

(c)  (d) 

1. Two charges  and  kept 2.4 Å apart forms a dipole. If it is kept in uniform electric field of intensity  then what will be its electrical energy in equilibrium

(a)  (b) 

(c)  (d) 

1. What is the angle between the electric dipole moment and the electric field strength due to it on the equatorial line

(a) 0o (b) 90o

(c) 180o (d) None of these

1. The electric field due to an electric dipole at a distance *r* from its centre in axial position is *E*. If the dipole is rotated through an angle of 90° about its perpendicular axis, the electric field at the same point will be

(a) *E* (b) *E* / 4

(c) *E* / 2 (d) 2*E*

**ANSWER KEY**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **c** | **2** | **d** | **3** | **b** | **4** | **d** | **5** | **a** |
| **6** | **b** | **7** | **d** | **8** | **d** | **9** | **b** | **10** | **b** |
| **11** | **c** | **12** | **c** | **13** | **b** | **14** | **c** | **15** | **b** |
| **16** | **b** | **17** | **d** | **18** | **b** | **19** | **d** | **20** | **d** |
| **21** | **d** | **22** | **c** | **23** | **a** | **24** | **a** | **25** | **a** |
| **26** | **d** | **27** | **d** | **28** | **c** | **29** | **b** | **30** | **b** |
| **31** | **c** | **32** | **d** | **33** | **a** | **34** | **b** | **35** | **a** |
| **36** | **a** | **37** | **b** | **38** | **c** | **39** | **c** |  |  |