

**DPP ELECTROSTATICS**

- An electric dipole of moment  $p$  is placed in a uniform electric field  $E$ , with  $p$  parallel to  $E$ . It is then rotated by an angle  $\theta$ . The work done is  
(a)  $pE\sin\theta$  (b)  $pE\cos\theta$  (c)  $pE(1-\cos\theta)$  (d)  $pE(1-\sin\theta)$
- 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 (S)  
(a)  $q.E$  and  $p.E$  (b) zero and minimum  
(c)  $q.E$  and maximum (d)  $2q.E$  and minimum  
(d)
- A dipole of electric dipole moment  $p$  is placed in a uniform electric field of strength  $E$ . If  $\theta$  is the angle between positive directions of  $p$  and  $E$ , then the potential energy of the electric dipole is largest when  $\theta$  is  
(a) zero (b)  $\pi/2$  (c)  $\pi$  (d)  $\pi/4$
- An electric dipole placed in a non-uniform electric field will experience (S)  
(a) only a force (b) only a torque  
(c) both force and torque (d) neither force nor torque.
- The angle between electric dipole moment and the electric field strength due to it on the axial line is: (S)  
(a)  $0^\circ$  (b)  $90^\circ$  (c)  $180^\circ$  (d) None of these
- The ratio of electric potential due to an electric dipole in the end-on position to that in the broad side-on position for the same distance from it, is  
(a)  $\infty$  (b) 2 (c) 1 (d) zero
- An electric dipole of dipole moment  $p$  placed in uniform electric field  $E$  will have minimum potential energy if the angle between  $p$  and  $E$  is (S)  
(A) 0 (B)  $\pi$  (C)  $\frac{\pi}{2}$  (D)  $\frac{3\pi}{2}$
- For a dipole  $q = 2 \times 10^{-6} \text{C}$  and  $d = 0.01 \text{m}$ . Calculate the maximum torque for this dipole if  $E = 5 \times 10^5 \text{N/C}$   
(a)  $1 \times 10^3 \text{Nm}^{-1}$  (b)  $10 \times 10^{-3} \text{Nm}^{-1}$  (c)  $10 \times 10^{-3} \text{Nm}$  (d)  $10 \times 10^2 \text{Nm}^2$