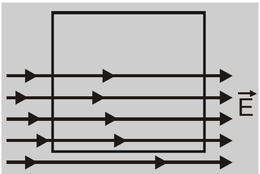
AIPMT 2006

1. A square surface of side L metres is in the plane of the paper. A uniform electric field $\vec{E}$ (volt/m), also in the plane of the paper, is limited only to the lower half of the square surface (see figure). The electric flux in SI units associated with the surface is :–



(1) zero (2) EL^2 (3) $\frac{EL^2}{2\in_0}$ (4) $\frac{EL^2}{2}$

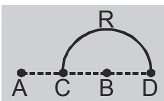
2. An electric dipole of dipole moment $\vec{p}$ is lying along a uniform electric field $\vec{E}$. The work done in rotating the dipole by 90° is :–

(1) 2pE (2) pE

(3) $\sqrt{2}pE$ (4) $\frac{pE}{2}$

AIPMT 2007

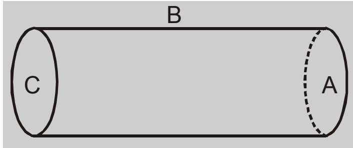
3. Charges +q and –q are placed at points A and B respectively which are a distance 2L apart, C is the mid point of A and B. The work done in moving a charge +Q along the semicircle CRD is :-



(1) $-\frac{qQ}{6\pi\in_0 L}$ (2) $\frac{qQ}{4\pi\in_0 L}$

(3) $\frac{qQ}{2\pi\in_0 L}$ (4) $\frac{qQ}{6\pi\in_0 L}$

4. A hollow cylinder has a charge q coulombs located within it symmetrically. If ϕ is the electric flux in unitsof volt-meter associated with the curved surface B, the flux linked with the plane surface A in units of volt-meters will be :-



(1) $\frac{q}{\in_0}-\phi$ (2) $\frac{1}{2}\left[\frac{q}{\in_0}-\phi\right]$

(3) $\frac{q}{2\in_0}$ (4) $\frac{\phi}{3}$

5. Three point charges +q, –2q and +q are placed at points (x = 0, y = a, z = 0),(x = 0, y = 0, z = 0) and (x = a, y = 0, z = 0) respectively. The magnitude and direction of the electric dipole moment vector of this charge assembly are :–

(1) $\sqrt{2}qa$ along + x direction

(2) $\sqrt{2}qa$ along + y direction

(3) $\sqrt{2}qa$ along the line joining points (x = 0, y = 0, z = 0) and (x = a, y = a, z = 0)

(4) qa along the line joining points (x = 0, y = 0, z = 0) and (x = a, y = a, z = 0)

AIPMT 2008

6. The electric potential at a point in free space due to a charge Q coulombs is $Q \times 10^{11}$ volts. The electric field at that point is :-

(1) $4\pi\in_0 Q \times 10^{20}$ volts/m

(2) $12\pi\in_0 Q \times 10^{22}$ volts/m

(3) $4\pi\in_0 Q \times 10^{22}$ volts/m

(4) $12\pi\in_0 Q \times 10^{20}$ volts/m

AIPMT(Mains) 2009

7. The electric potential at a point (x, y, z) is given by:

$V = -x^2y - xz^3 + 4$

The electric field $\vec{E}$ at that point is :-

(1) $\vec{E} = \hat{i}(2xy - z^3) + \hat{j}xy^2 + \hat{k}3z^2x$

(2) $\vec{E} = \hat{i}(2xy + z^3) + \hat{j}x^2 + \hat{k}3xz^2$

(3) $\vec{E} = \hat{i}2xy + \hat{j}(x^2 + y^2) + \hat{k}(3xz - y^2)$

(4) $\vec{E} = \hat{i}z^3 + \hat{j}xyz + \hat{k}z^2$

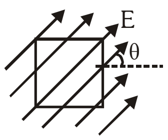
AIPMT(Pre) 2010

8. Two positive ions, each carrying a charge q, are separated by a distance d. If F is the force of repulsion between the ions, then the number of electrons missing from each ion will be (e being the charge on an electron) :-

(1) $\frac{4\pi \epsilon_0 Fd^2}{q^2}$ (2) $\frac{4\pi \epsilon_0 Fd^2}{e^2}$

(3) $\sqrt{\frac{4\pi \epsilon_0 Fe^2}{d^2}}$ (4) $\sqrt{\frac{4\pi \epsilon_0 Fd^2}{e^2}}$

9. A square surface of side L meters in the plane of the paper is placed in a uniform electric field E (volts/m) acting along the same plane at an angle θ with the horizontal side of the square as shown in figure. The electric flux linked to the surface, in units of volt–m, is :-



(1) Zero

(2) EL^2

(3) $EL^2\cos\theta$

(4) $EL^2\sin\theta$

AIPMT(Mains) 2010

10. The electric field at a distance $\frac{3R}{2}$ from the centre of a charged conducting spherical shell of radius R is E. The electric field at a distance $\frac{R}{2}$ from the centre of the sphere is :-

(1) E (2) $\frac{E}{2}$ (3) $\frac{E}{3}$ (4) Zero

AIPMT(Pre) 2011

11. A charge Q is enclosed by a Gaussian spherical surface of radius R. If the radius is doubled, then the outward electric flux will :-

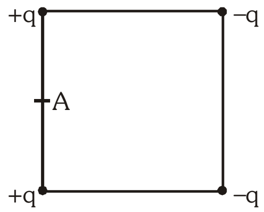
(1) increase four times

(2) be reduced to half

(3) remain the same

(4) be doubled

12. Four electric charges + q, +q, – q and – q are placed at the corners of a square of side 2L(see figure). The electric potential at point A, midway between the two charges +q and +q, is :-

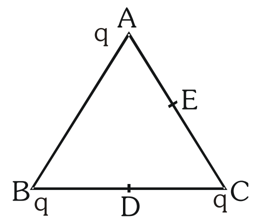


(1) $\frac{1}{4\pi \epsilon_0}\frac{2q}{L}(1+\sqrt{5})$ (2) $\frac{1}{4\pi \epsilon_0}\frac{2q}{L}\left(1+\frac{1}{\sqrt{5}}\right)$

(3) $\frac{1}{4\pi \epsilon_0}\frac{2q}{L}\left(1-\frac{1}{\sqrt{5}}\right)$ (4) Zero

AIPMT(Mains) 2011

13. Three charges each +q are placed at the three corners of an isosceles triangle ABC with sides BC and AC each equal to 2a. D and E are the mid points of BC and CA respectively. The work done in taking a charge Q from D to E is :-



(1) $\frac{3qQ}{4\pi \epsilon_0 a}$

(2) $\frac{3qQ}{8\pi \epsilon_0 a}$

(3) $\frac{qQ}{4\pi \epsilon_0 a}$

(4) Zero

14. The electric potential V at any point (x, y, z). (all in metres) in space is given by $V = 4x^2$ volts. The electric field at the point (1, 0, 2) in volt/meter, is :-

(1) 8 along negative X-axis

(2) 8 along positive X-axis

(3) 16 along negative X-axis

(4) 16 along positive X-axis

15. What is the flux through a cube of side 'a' if a point charge q is at one of its corner ?

(1) $\frac{q}{\epsilon_0}$ (2) $\frac{q}{2\epsilon_0}6a^2$ (3) $\frac{2q}{\epsilon_0}$ (4) $\frac{q}{8\epsilon_0}$

AIPMT(Pre) 2012

16. An electrical dipole of moment 'p' is placed in an electric field of intensity 'E'. The dipole acquires a position such that the axis of the dipole makes an angle θ with the direction of the field. Assuming that the potential energy of the dipole is zero when $\theta = 90°$, the torque and the potential energy of the dipole will be respectively :-

(1) $p E \sin\theta$, $2p E \cos\theta$

(2) $p E \cos\theta$, $-p E \sin\theta$

(3) $p E \sin\theta$, $-p E \cos\theta$

(4) $p E \sin\theta$, $-2p E \cos\theta$

17. Four point charges –Q, –q, 2q and 2Q are placed, at different corners of a square. The relation between Q and q for which the potential at the centre of the square is zero is :-

(1) $Q = q$ (2) $Q = \frac{1}{q}$

(3) $Q = -q$ (4) $Q = -\frac{1}{q}$

AIPMT(Mains) 2012

18. Two metallic spheres of radii 1 cm and 3 cm are given charges of -1×10^{-2} C and 5×10^{-2} C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is :-

(1) 4×10^{-2} C

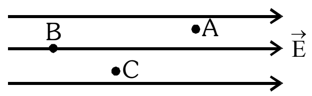
(2) 1×10^{-2} C

(3) 2×10^{-2} C

(4) 3×10^{-2} C

NEET-UG 2013

19. A, B and C are three points in a uniform electric field. The electric potential is :-



(1) same at all the three points A,B and C

(2) maximum at A

(3) maximum at B

(4) maximum at C

AIPMT 2014

20. A conducting sphere of radius R is given a charge Q. The electric potential and the electric field at the centre of the sphere are respectively :-

(1) Zero and $\frac{Q}{4\pi \in_0 R^2}$

(2) $\frac{Q}{4\pi \in_0 R}$ and Zero

(3) $\frac{Q}{4\pi \in_0 R}$ and $\frac{Q}{4\pi \in_0 R^2}$

(4) Both are zero

21. In a region, the potential is represented by $V(x, y, z) = 6x - 8xy - 8y + 6yz$, where V is in volts and x, y, z are in metres. The electric force experienced by a charge of 2 coulombs situated at the point (1, 1, 1) is :-

(1) $6\sqrt{5}$ N (2) 30 N

(3) 24 N (4) $4\sqrt{35}$ N

AIPMT 2015

22. The electric field in a certain region is acting radially outward and is given by E = Ar. The charge contained in a sphere of radius 'a' centred at the origin of the field, will be given by :

(1) $A \varepsilon_0 a^2$ (2) $4 \pi\varepsilon_0 Aa^3$

(3) $\varepsilon_0 Aa^3$ (4) $4 \pi\varepsilon_0 Aa^2$

Re-AIPMT 2015

23. If potential (in volts) in a region is expressed as $V (x,y,z) = 6xy - y + 2yz$, the electric field (in N/C) at point (1,1,0) is :

(1) $-(6\hat{i} + 9\hat{j} + \hat{k})$ (2) $-(3\hat{i} + 5\hat{j} + 3\hat{k})$

(3) $-(6\hat{i} + 5\hat{j} + 2\hat{k})$ (4) $-(2\hat{i} + 3\hat{j} + \hat{k})$

NEET-II 2016

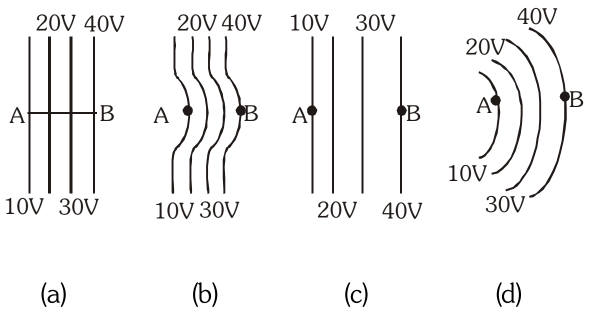
24. An electric dipole is placed at an angle of 30° with an electric field intensity 2×10^5 N/C. It experiences a torque equal to 4 Nm. The charge on the dipole, if the dipole length is 2 cm, is :-

(1) 5 mC (2) 7 μC

(3) 8 mC (4) 2 mC

NEET(UG)-2017

25. The diagrams below show regions of equipotentials:-



A positive charge is moved from A to B in each diagram.

(1) In all the four cases the work done is the same

(2) Minimum work is required to move q in figure (a)

(3) Maximum work is required to move q in figure (b)

(4) Maximum work is required to move q in figure (c)

26. Suppose the charge of a proton and an electron differ slightly. One of them is – e, the other is (e + Δe). If the net of electrostatic force and gravitational force between two hydrogen atoms placed at a distance d (much greater than atomic size) apart is zero, then Δe is of the order of [Given mass of hydrogen $m_h = 1.67 \times 10^{-27}$ kg]

(1) 10^{-23} C
(2) 10^{-37} C
(3) 10^{-47} C
(4) 10^{-20} C

NEET(UG)-2018

27. An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E. The direction of electrical field is now reversed, keeping its magnitude the same. A proton is allowed to fall from rest in through the same vertical distance h. The time of fall of the electron, in comparison to the time of fall of the proton is :-

(1) smaller

(2) 5 times greater

(3) 10 times greater

(4) equal

NEET(UG)-2019

28. A hollow metal sphere of radius R is uniformly charged. The electric field due to the sphere at a distance r from the centre :

(1) increases as r increases for r < R and for r > R

(2) zero as r increases for r < R, decreases as r increases for r > R

(3) zero as r increases for r < R, increases as r increases for r > R

(4) decreases as r increases for r < R and for r > R

29. Two parallel infinite line charges with linear charge densities $+\lambda$ C/m and $-\lambda$ C/m are placed at a distance of 2R in free space. What is the electric field mid-way between the two line charges?

(1) zero

(2) $\frac{2\lambda}{\pi \epsilon_0 R}$ N/C

(3) $\frac{\lambda}{\pi \epsilon_0 R}$ N/C

(4) $\frac{\lambda}{2\pi \epsilon_0 R}$ N/C

30. Two point charges A and B, having charges +Q and –Q respectively, are placed at certain distance apart and force acting between them is F. If 25% charge of A is transferred to B, then force between the charges becomes:

(1) F
(2) $\frac{9F}{16}$
(3) $\frac{16F}{9}$
(4) $\frac{4F}{3}$

NEET(UG)-2019 (Odisha)

31. A sphere encloses an electric dipole with charge $\pm 3 \times 10^{-6}$ C. What is the total electric flux across the sphere ?

(1) -3×10^{-6} Nm^2/C (2) zero

(3) 3×10^{-6} Nm^2/C (4) 6×10^{-6} Nm^2/C

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**1**	**2**	**1**	**2**	**3**	**3**	**2**	**4**	**1**	**4**	**3**	**3**	**4**	**1**	**4**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**3**	**3**	**4**	**3**	**2**	**4**	**2**	**3**	**4**	**1**	**2**	**1**	**2**	**3**	**2**
Que.	31														
Ans.	**2**														