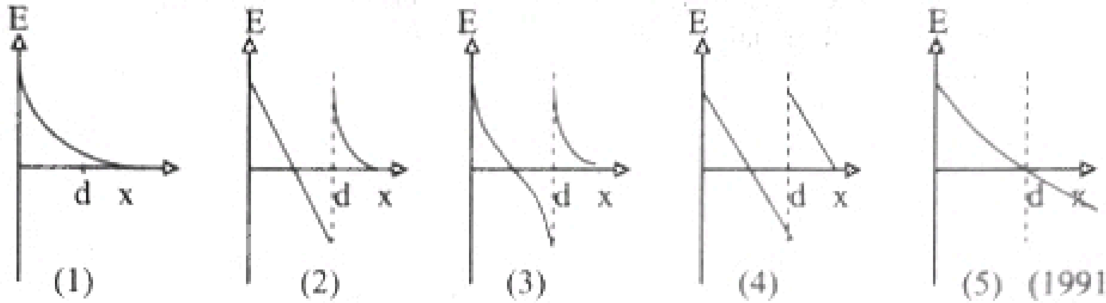
Physics English Classified MCQ
Electrostatic Force Field
1992 - 2016

Electrostatic Force Field

01. Electric Field Intensity and Coulomb's Law

01) 

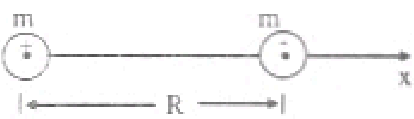
Each of the two equal point charges of + q are placed along the x axis at a distance d apart as shown in the figure. Assuming that the left hand charge is at x = o the variation of the electric field intensity (E) with *x* is best represented by,

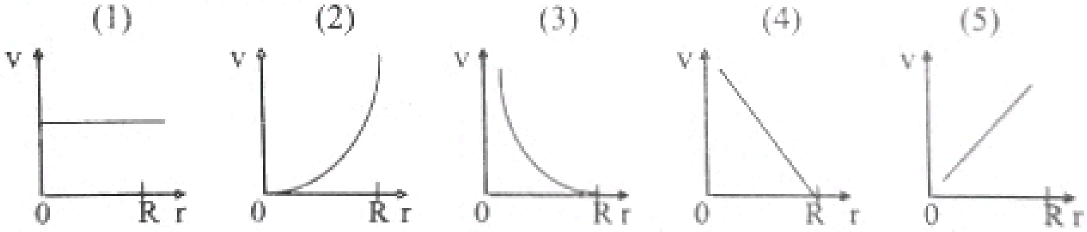


(1991)

02) A body is charged to a value of -32C, If the electronic charge is equal to -1.6×10^{-19} C, then the excess number electrons existing in the body is,
1) 0 2) 10^{19} 3) 2×10^{19} 4) 10^{20} 5) 2×10^{20} (1992)

03) Two identical bodies each of mass m kept at a distance R apart on the x axis, as shown in the figure, are released from rest, If the influences of other bodies on these masses are negligible which of the following graphs best represents the variation of the velocity (V) of the bodies with their distance (r) apart?





(1992)

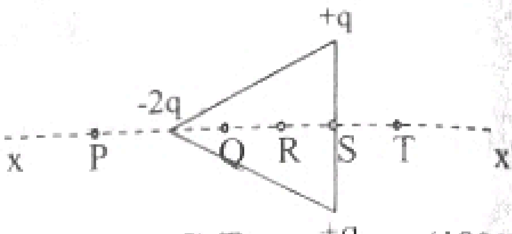
04) The minimum amount of charge which should be placed on each body in order to counter balance the gravitational attraction between the bodies mentioned in question 47 above is,

1) $\frac{Gm}{R}$ 2) $\sqrt{Gm}$ 3) $m\sqrt{\pi G}$ 4) $2m\sqrt{\pi G\varepsilon_0}$ 5) $2mR\pi\varepsilon_0$ (1992)

05) Two small spheres of equal masses are suspended from two identical light inextensible strings. The free ends of the strings are connected to a common point at the ceiling. One sphere has a charge + Q and the other has a charge + 2Q . If the string attached to Q makes an angle θ with the vertical, the angle that the other string makes with the vertical is,

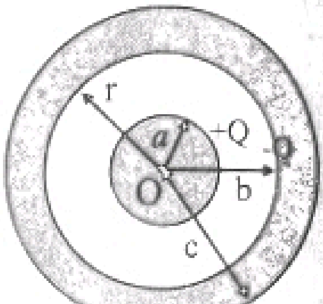
1) 0 2) $\frac{\theta}{4}$ 3) $\frac{\theta}{2}$ 4) θ 5) 2θ (1994)

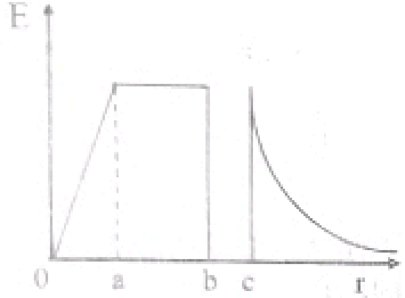
06) Charges +q, +q and -2q are placed at the corners of a equilateral triangle, as shown in the figure . The point along the line XX' at which the electric field intensity is most likely to be zero is



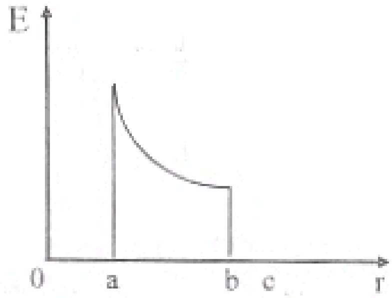
1) P   2) Q   3) R   4) S   5) T   (1995)

07) A conducting sphere and a concentric conducting spherical shell carry charges +Q and –Q respectively, as shown in the figure. The variation of the electric field intensity E, with radial distance r from the centre O is best represented by,

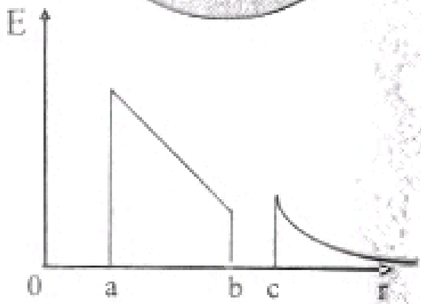




(1)



(2)



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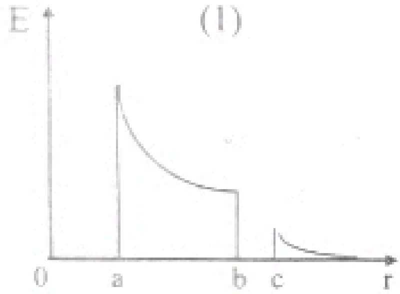

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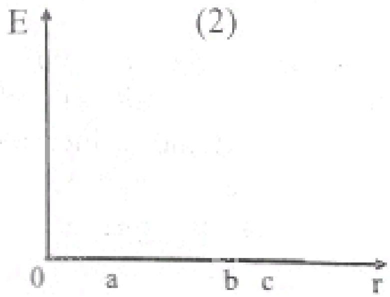
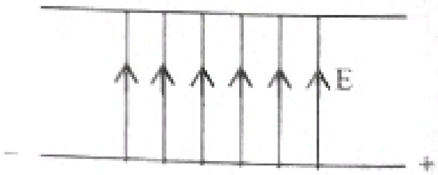
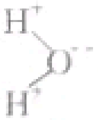


(5)

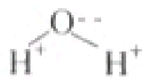
(1999)

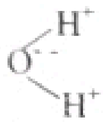
08) If a water molecule is placed in the electric field shown in figure, which orientation would it take in order to minimize its energy ?




(1)


(2)


(3)


(4)

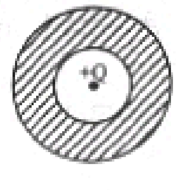

(5)

(2002)

09) Two identical conducting sphere *A* and *B* carry equal charges. The spheres are separated by a distance which is much larger than their distances. The electrostatic force acting between them is *F*. Now a third identical uncharged conducting sphere is first made to touch *A* and secondly *B* and then removed. The new value of the force acting between *A* and *B* is,

1) 0   2) $\frac{F}{16}$ 3) $\frac{F}{4}$ 4) $\frac{3F}{8}$ 5) $\frac{F}{2}$ (2006)

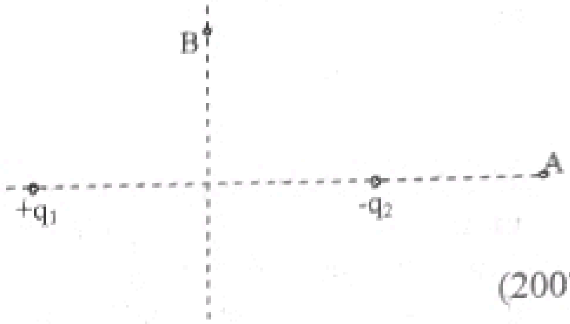
10) The figure shows a spherical conducting shell. A point charge $+Q$ is placed at the centre of the shell and charge $-Q$ is given to the shell. Finally the shell will have



i) zero charge on the inner surface $-q$ on the outer surface.
ii) $-Q$ charge on the inner surface $-q$ on the surface
iii) $-Q$ charge on the inner surface $-q+Q$ on the outer surface.
iv) $+Q$ charge on the inner surface $-q-Q$ on the outer surface.
v) $-Q-\frac{q}{2}$ on the inner surface. $+Q-\frac{q}{2}$ on the outer surface.

(2007)

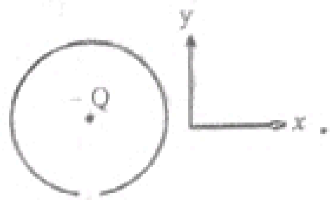
11) Two point charges $+q_1$ and $-q_2$ are placed as shown in the figure. Resultant electric field intensity could be zero at a point.



1) A, if $q_1 = q_2$
2) A, if $q_1 > q_2$
3) A, if $q_1 < q_2$
4) B, if $q_1 = q_2$
5) B, if $q_1 > q_2$

(2007)

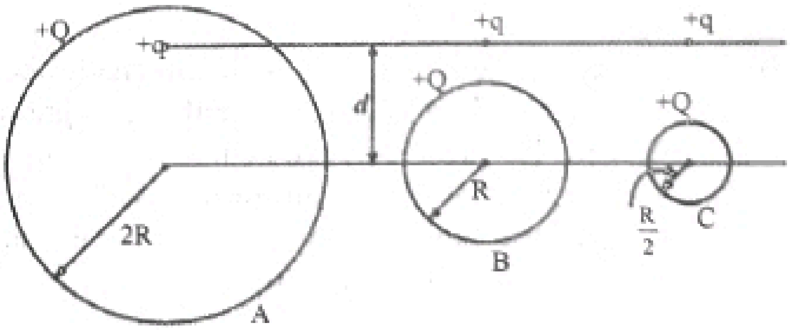
12) A charge +q is uniformly distributed along a very thin non – conducting circular ring of radius R and a charge – Q placed at the centre of the ring. Now a very small part containing a charge Δq is removed from the ring as shown in figure. The electrostatic force acting on the charge –Q at the centre of the ring is,



1) zero
2) $\frac{1}{4\pi\varepsilon_0}\frac{Q(q-\Delta q)}{R^2}$ along + y direction
3) $\frac{1}{4\pi\varepsilon_0}\frac{Q(q-\Delta q)}{R^2}$ along – y direction
4) $\frac{1}{4\pi\varepsilon_0}\frac{Q(\Delta q)}{R^2}$ along + y direction
5) $\frac{1}{4\pi\varepsilon_0}\frac{Q(\Delta q)}{R^2}$ along – y direction

(2009)

13) Figure shows three isolated systems (A, B and C) each having a point +q uniformly charges conducting shell of charge +Q. If the respective electrostatic force between the point charge and the shell are given by F_A, F_B and F_C then,



1) $F_A = 0, F_B > F_C$
2) $F_A = 0, F_B = F_C$
3) $F_A = 0, F_C > F_B$
4) $F_A < F_B < F_C$
5) $F_A = F_B = F_C$

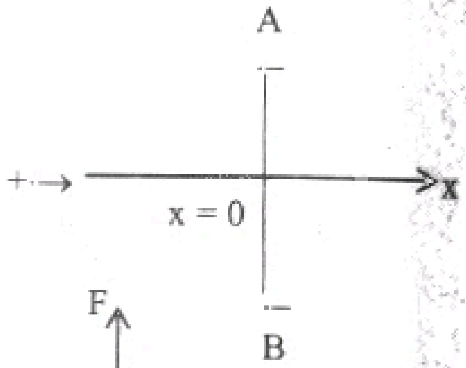
(2009)

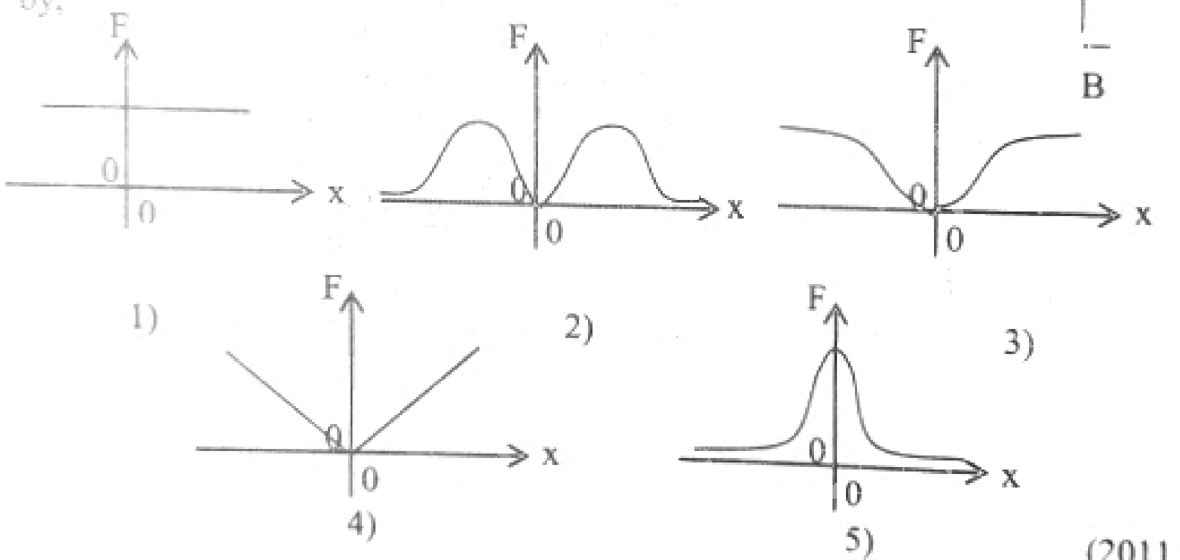
14) A small conducting sphere of mass m has a +Q charge. This sphere is hung from an insulating thread of length l in a region where there is an electric field of intensity E in vertically downward direction. (In addition to the gravitational field) and is allowed to oscillate as a simple pendulum. If the period of small oscillations of this simple pendulum is T, then

(1) $T = 2\pi\sqrt{\frac{l}{g}}$ (2) $T = 2\pi\sqrt{\frac{l}{g+E}}$ (3) $T = 2\pi\sqrt{\frac{l}{g+QE}}$

(4) $T = 2\pi\sqrt{\frac{l}{g-\frac{QE}{m}}}$ (5) $T = 2\pi\sqrt{\frac{l}{g+\frac{QE}{m}}}$ (2010)

15) The figure shows a positive, point – like charge moving along a straight path between two fixed equal negative point charges.
The variation of magnitude F of the net force on the positive charge due to the two negative charges, with the distance x, is best represented by,



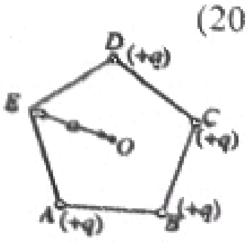


(2011 N)

16) Which of the following statements made about electric field lines is **false** ?
1) Electric field lines can be either straight or curved
2) Electric field lines can be parallel to one another.
3) Electric field lines can form closed loops
4) Electric field lines begin on positive charges and end on negative changes
5) Electric field lines can never intersect wit one another.

(2012 N)

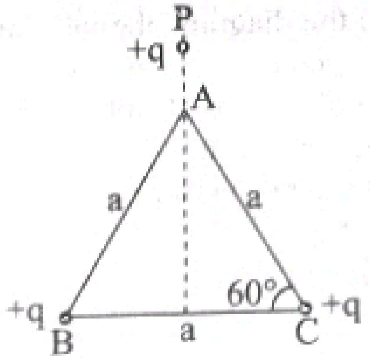
17) Four particles each having a charge of +q are placed on four vertices of a regular pentagon as shown in figure. The distance from the centre O of the pentagon to a vertex is a. The electric field inensity at the centre of the pentagon is,



1) $\frac{q}{4\pi\varepsilon_0 a^2}$ in the OE direction 2) $\frac{q}{4\pi\varepsilon_0 a^2}$ in the EO direction

3) $\frac{q}{\pi\varepsilon_0 a^2}$ in the OE direction 4) $\frac{q}{\pi\varepsilon_0 a^2}$ in the EO direction 5) zero(2014)

18) Two point charges of $+q$ each, are held at vertices B and C of an equilateral triangle ABC of side length a, and another point charge of $+q$ is held at the point P as shown in the figure. A zero resultant force will act on a positive unit charge placed at point A when the distance AP is equal to,



1) $\sqrt{2}a$ 2) $\frac{a}{2}$ 3) $\frac{a}{\sqrt{(\sqrt{3})}}$ 4) $\frac{a}{4}$ 5) a (2016)

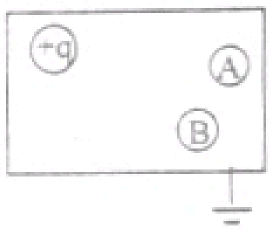
02. Gauss Theorem

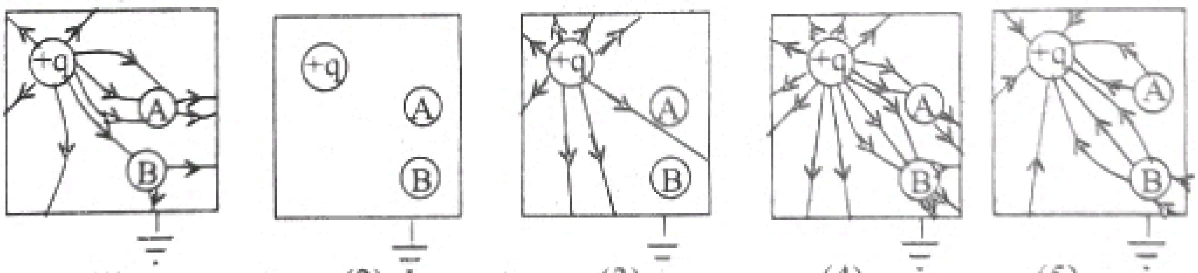
01) Of the four figures (A) to (D) shown the total electric flux leaving the closed surface S is zero in

(A) (B) (C) (D)

(1) (A) and (B) Only (2) (C) and (D) only (3) (B) and (D) only
(4) (B), (C) and (D) only (5) all four cases (1991)

02) A conducting sphere carrying a charge +Q is placed together with two other uncharged conducting spheres A and B in an earthed metallic box as shown in the figure. If there is no electrical contact among the spheres and the box , which of the following diagrams correctly represents the electric field around spheres?



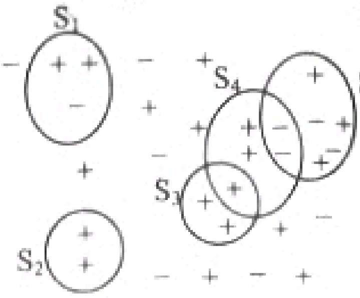


(1) (2) (3) (4) (5)

(1992)

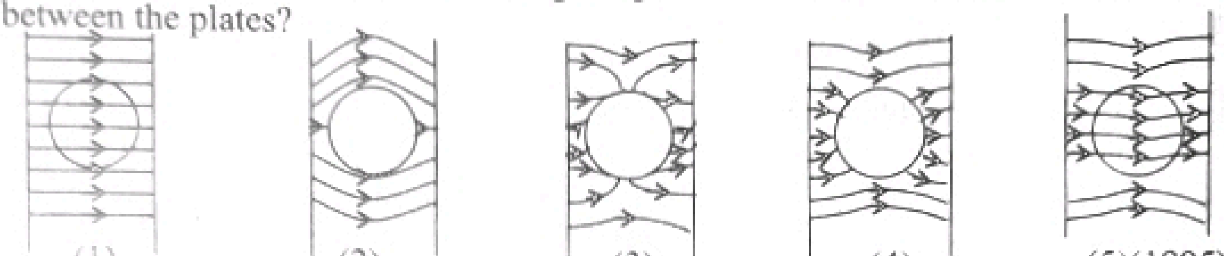
03) If the number of electric field lines (electric flux) entering a closed surface is greater than the number (flux) leaving, then,
(1) there cannot be any charge inside the closed surface
(2) there can be equal amounts of positive and negative charges inside the closed surface
(3) there can be more negative charges than positive charges inside the closed surface
(4) there can be Only positive charges inside the closed surface
(5) there can be Only negative charges inside the closed surface (1992)

04) In the diagram shown + and – symbols represent +q and – q charges respectively in a charge distribution. S_1 to S_5 five closed spherical surfaces drawn by a student enclosing these charges. The total outward electric flux from the surfaces is maximum in,



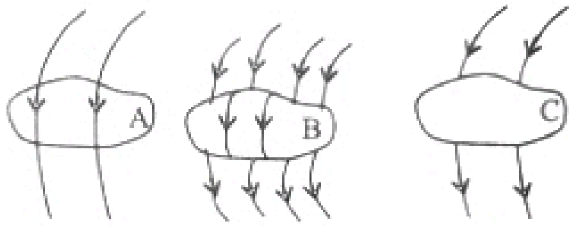
1) S_1 2) S_2 3) S_3
4) S_4 5) S_5 (1993)

05) A metal sphere is placed in the region between two oppositely charged parallel plates. Which one of the following diagrams best represents the electric field between the plates?



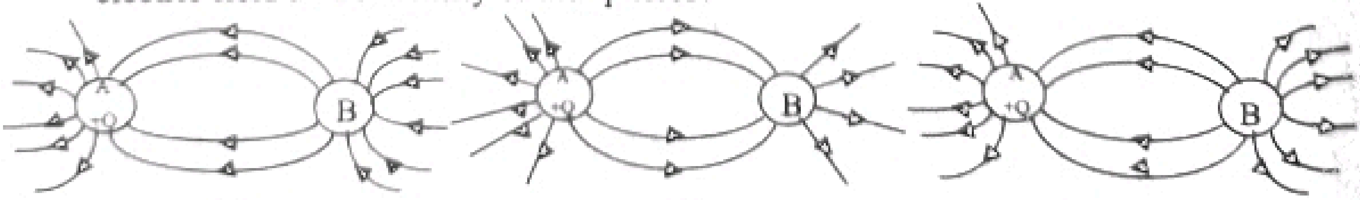
(1) (2) (3) (4) (5)(1995)

06) The paths of electric lines of forces in and around three regions A, B and C are shown in the figure. Which of the following combinations correctly describe the nature of the regions

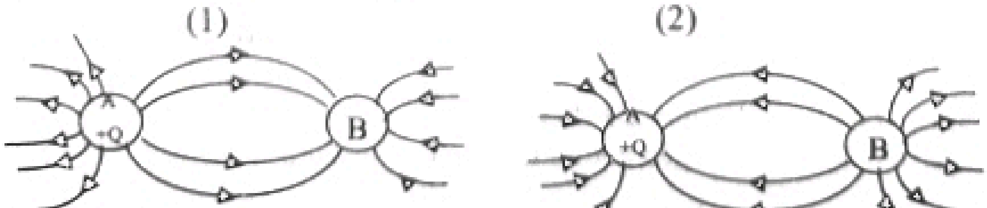


	A	B	C
1)	Uncharged conductor	Charged conductor	Dielectric
2)	Free space with zero net charge.	Dielectric	Charged conductor
3)	Dielectric.	Free space with positive charge	Free space with zero net charge
4)	Free space with zero net charge.	Dielectric	Uncharged conductor
5)	Uncharged conductor	Free space with negative charge	Dielectric (1995)

07) A positively charged metal sphere A and an uncharged metal sphere B are placed close to each other. Which of the following diagrams correctly represents the electric field at the vicinity of the spheres?



(1) (2) (3)

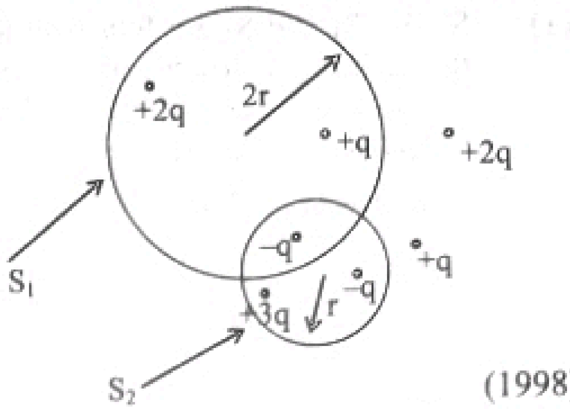


(4) (5) (1998)

08) S_1 and S_2 are two hypothetical spherical surfaces of radii 2r and r. drawn in a charge distribution of point charges having magnitudes –q, +q, +2q and +3q. The ratio,

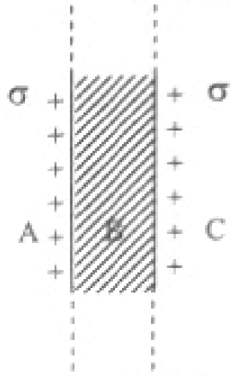
$$\frac{\text{Net electric flux passing through } S_1}{\text{Net electric flux passing through } S_2} \text{ is}$$

1) 1 2) 2 3) 4
4) 8 5) 16



(1998)

09) An infinitely long thick conducting sheet shown in the figure carries a uniform surface charge density σ. The electric field intensities in the regions A, B and C respectively are,

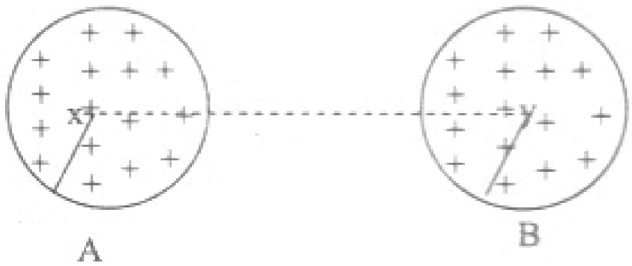


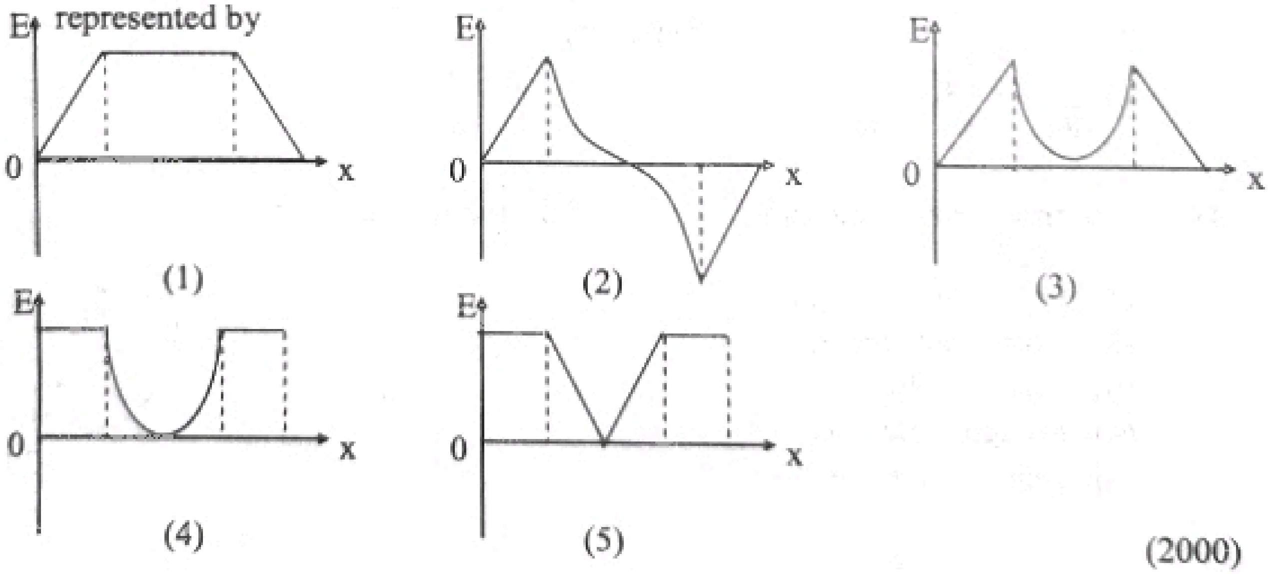
1) $\frac{\sigma}{2\varepsilon_o}, \frac{\sigma}{\varepsilon_o}, \frac{\sigma}{2\varepsilon_o}$ 2) $\frac{\sigma}{\varepsilon_o}, 0, \frac{\sigma}{\varepsilon_o}$ 3) $\frac{2\sigma}{\varepsilon_o}, 0\ \frac{2\sigma}{\varepsilon_o}$

4) $0, \frac{\sigma}{2\varepsilon_o}, 0$ 5) $\frac{\sigma}{2\varepsilon_o}, 0, \frac{\sigma}{2\varepsilon_o}$

(2000)

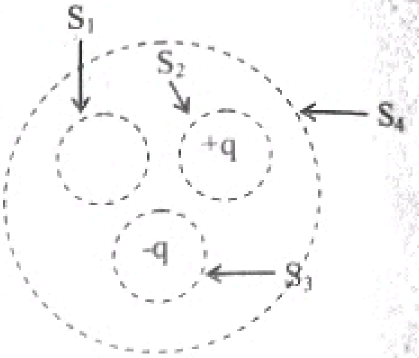
10) A and B are two uniformly charged identical, non conducting solid spheres carrying equal charges. The distance between the spheres is very much greater than their radii r. The variation of the electric field intensity. E along xy from x to y from is best represented by





(2000)

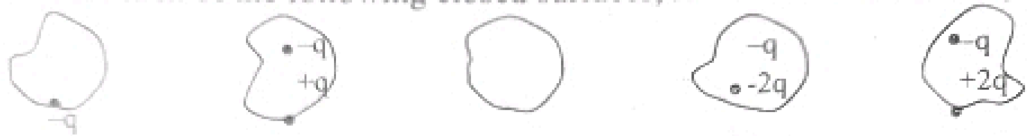
11) S_1, S_2, S_3 and S_4 are four Gaussian surfaces drawn in the vicinity of two equal and opposite charges +q and –q as shown. The net electric flux through the surface S_1, S_2, S_3 and S_4 are represented by ϕ_1, ϕ_2, ϕ_3 and ϕ_4 respectively. Which of the following is correct?



1) $\phi_1 = 0,\ \phi_2 = 0,\ \phi_3 = 0,\ \phi_4 = 0$
2) $\phi_1 = 0,\ \phi_2 > 0,\ \phi_3 < 0,\ \phi_4 = 0$
3) $\phi_1 > 0,\ \phi_2 > 0,\ \phi_3 < 0,\ \phi_4 > 0$
4) $\phi_1 > 0,\ \phi_2 > 0,\ \phi_3 < 0,\ \phi_4 = 0$
5) $\phi_1 < 0,\ \phi_2 > 0,\ \phi_3 < 0,\ \phi_4 > 0$

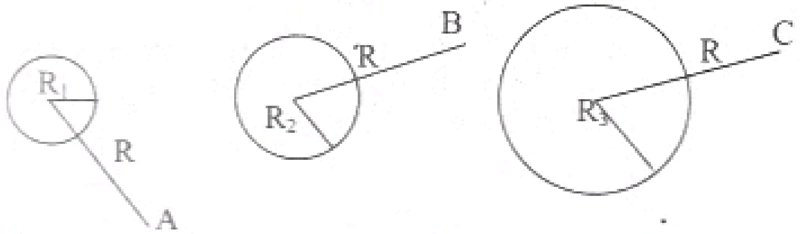
(2001)

12) Across which of the following closed surfaces, is the net electric flux positive?



(1) (2) (3) (4) (5) (2002)

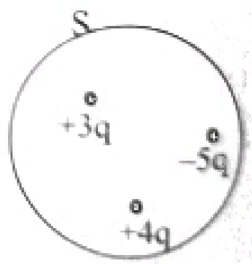
13) Figure shows three conducting spheres of radii R_1, R_2 and R_3 ($R_1 < R_2 < R_3$) each carrying a charge Q. If the electric field intensities at points A, B and C at a distance R form the centre of each sphere are E_A, E_B and E_C respectively, than



1) $E_A > E_B > E_C$
2) $E_A = E_B = E_C$
3) $E_A < E_B < E_C$
4) $\frac{E_A}{R_1} = \frac{E_B}{R_2} = \frac{E_C}{R_3}$
5) $\frac{E_A}{R_1^2} = \frac{E_B}{R_2^2} = \frac{E_C}{R_3^2}$

(2003)

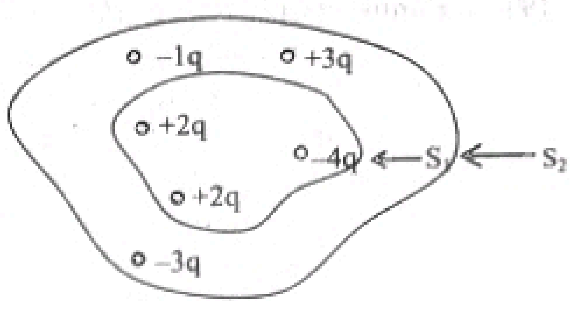
14) Net flux through the closed surface S in the diagram cab be reversed by ,



(1) changing the + 3q to + 4q
(2) changing the + 4q to + 3q
(3) changing the + 5q to + 7q
(4) changing the + 3q to + 1q
(5) changing the + 4q to + 1q

(2003)

15) Consider the following statements made regarding the charge distribution shown

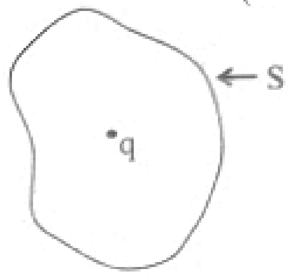


(A) No electric field lines cross the closed surface S_1
(B) Total electric flux due to the charge +3q does not depend on the rest of the charges present
(C) Net electric flux through the closed surface is S_2 not zero

Of the above statements
(1) Only (C) is true
(2) Only (A) and (B) are true
(3) Only (B) and (C) are true
(4) Only (A) and (C) are true
(5) all (A), (B) and (C) are true

(2004)

16) S is a Guassian surface and q is a charge inside it. Consider the following statements made about the net electric flux Φ through the surface S.

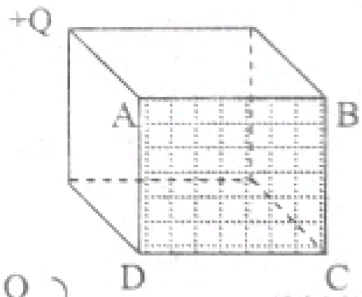


A) If the volume enclosed by the surface S increases, then Φ increases.
B) If the charge q is moved close to the surface S then Φ increases.
C) Even if the shape of the surface S is changed Φ remains the same

Of the above statements,
1) only (A) is true
2) only (B) is true.
3) only (C) is true
4) only (A) and (B) are true
5) only (B) and (C) are true.

(2006)

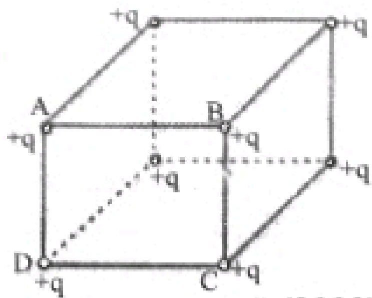
17) A point change $+Q$ is placed at one of the corners of a cube as shown in the figure. The electric flux through the surface $ABCD$ of the cube due to the charge is,



1) Q $\left(\text{or } \frac{Q}{\varepsilon_0}\right)$
2) $\frac{Q}{4}\left(\text{or } \frac{Q}{4\varepsilon_0}\right)$
3) $\frac{Q}{6}\left(\text{or } \frac{Q}{6\varepsilon_0}\right)$
4) $\frac{Q}{24}$ or $\frac{Q}{24\varepsilon_0}$
5) $\frac{Q}{36}\left(\text{or } \frac{Q}{36\varepsilon_0}\right)$

(2008)

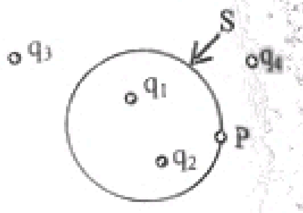
18) Eight +q point chrges are placed at the vertices of a cube as shown in the figure. The number of electric field lines passing through the face ABCD due to charges is,



1) $\frac{q}{3\varepsilon_0}$
2) $\frac{q}{4\varepsilon_0}$
3) $\frac{q}{6\varepsilon_0}$
4) $\frac{q}{24\varepsilon_0}$
5) $\frac{q}{48\varepsilon_0}$

(2009)

19) Figure shows four point charges and a Gaussian surface S. Consider the following statements,



(A) Net electric flux through the surface depends only on the fields produced by q_1 and q_2 .

(B) The electric field intensity at point P depends only on the fields produced by q_1 and q_2 .

(C) The electric field intensity at point P depends on the location of the charges q_1, q_2, q_3 and q_4 .

Of the above statements,

(1) only (A) is true
(2) only (A) and (B) are true
(3) only (B) and (C) are true
(4) only (A) and (C) are true
(5) all (A), (B) and (C) are true

(2010)

20) A spherical Gaussian surface surrounds a point charge q. The following changes were made to the system.

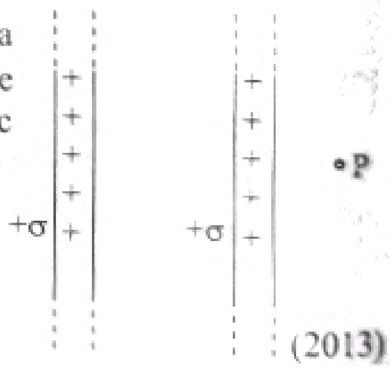
(A) The magnitude of the charge was tripled
(B) The radius of the spherical Gaussian surface was doubled.
(C) The spherical Gaussian surface was changed to a surface of a cube.
(D) The charge was moved to another location inside the surface.

Of the changes mentioned above, the net electric flux through the surface is changed only in

1) only A
2) only A and B
3) only C and D
4) only A, B and D
5) all A, B, C, D

(2012 N)

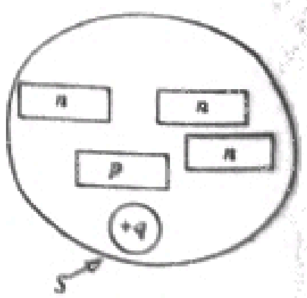
21) Two large non-conducting plane sheets, each having a uniform surface charge density $+\sigma$ on one side, are situated parallel to each other as shown. The electric field intensity at a point P is



1) $\frac{2\sigma}{\varepsilon_0}$
2) $\frac{\sigma}{\varepsilon_0}$
3) $\frac{\sigma}{2\varepsilon_0}$
4) $\frac{\sigma}{4\varepsilon_0}$
5) 0

(2013)

22) A Gaussian surface S encloses a metal sphere carrying a charge of $+q$, three n-type semiconductor pieces each having a number of free electrons corresponding to charge $-q$, and one p-type semiconductor piece having a number of holes corresponding to charge of $+q$ as shown in figure. Total electric flux through the surface can be made zero by



A) removing one n-type semiconductor piece
B) adding one more p-type semiconductor piece with the same hole concentration.
C) bringing a metal sphere carrying a charge of $-q$ from outside into the enclosed volume.

Of the above three methods.

1) only A is true
2) only C is true
3) only A and B are true
4) only B and C are true
5) All A, B and C are true

(2014)

23) Figures (A), (B) and (C) show three situations where a charge of +q is surrounded by a spherical Gaussian surface of radius r. If ψ_L and ψ_R are the electric fluxes through the left and right hemispherical sections of the Gaussian surface respectively, which of the following is true regarding ψ_L and ψ_R

	(A)	(B)	(C)
(1)	$\psi_L = \psi_R = \frac{q}{2\varepsilon_0}$	$\psi_L = \psi_R = \frac{q}{2\varepsilon_0}$	$\psi_L = \psi_R = \frac{q}{2\varepsilon_0}$
(2)	$\psi_L > \frac{q}{2\varepsilon_0} > \psi_R$	$\psi_L = \psi_R = \frac{q}{2\varepsilon_0}$	$\psi_L < \frac{q}{2\varepsilon_0} < \psi_R$
(3)	$\psi_L > \frac{q}{\varepsilon_0} > \psi_R$	$\psi_L = \psi_R = \frac{q}{\varepsilon_0}$	$\psi_L < \frac{q}{\varepsilon_0} < \psi_R$
(4)	$\psi_L = \psi_R = \frac{q}{\varepsilon_0}$	$\psi_L = \psi_R = \frac{q}{\varepsilon_0}$	$\psi_L = \psi_R = \frac{q}{\varepsilon_0}$
(5)	$\psi_L < \frac{q}{2\varepsilon_0} < \psi_R$	$\psi_L = \psi_R = \frac{q}{2\varepsilon_0}$	$\psi_L > \frac{q}{2\varepsilon_0} > \psi_R$

(2015)

03. Electrostatic Potential

1) An electron (charge = - 1.6×10^{-19} C) is accelerated through a potential difference of 10^5V. The energy acquired by, the electron is,

1) 0.5×10^{-24} J 2) 1.6×10^{-24} J 3) 3.2×10^{-24} J
4) 1.6×10^{-14} J 5) 3.2×10^{-14} J (1992)

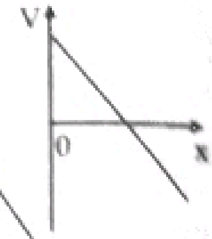
2) Two concentric spherical metal shells of radii R and 2R carry charges 4Q and 3Q respectively. The quantity of charge that passes from one to the other when the two shells are connected together by a conducting wire is,

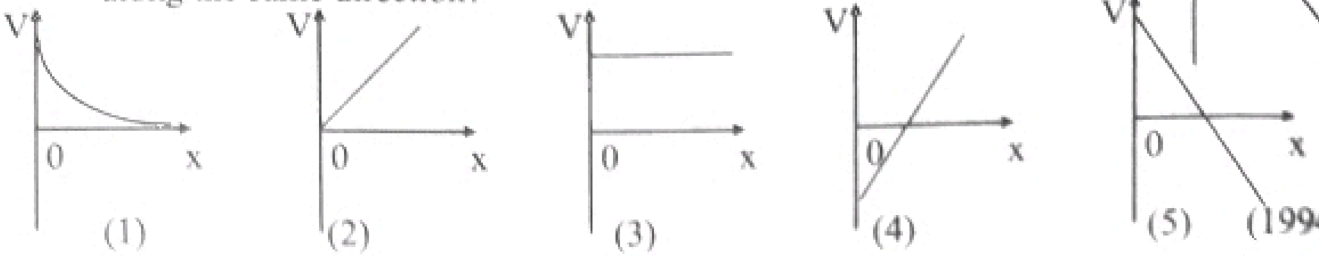
1) 4Q 2) 2Q 3) Q 4) Q/2 5) zero (1993)

3) Suppose a charged particle is found in the space between two parallel metal plates which placed in an evacuated tube. If a constant potential difference is maintained between the plates and the separation between the plates, d, is varied, the electric force experienced by the charged particle is proportional to

1) d^2 2) d 3) $d^{1/2}$ 4) d^{-1} 5) d^2 (1994)

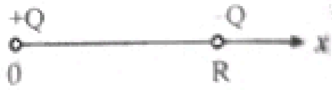
4) Figure shows the variation of the electrostatic potential, V along the x- direction. Which one of the following curves best represents the variation of the electric field intensity, E along the same direction?

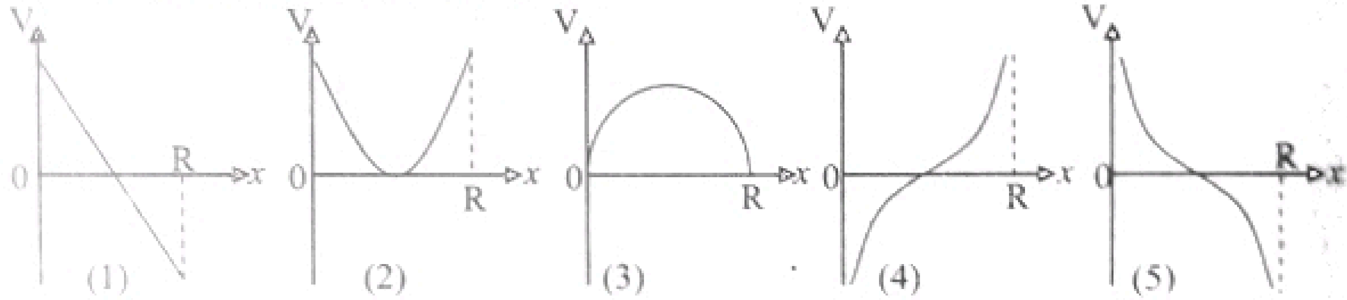




(1994)

5) Two small spheres carrying charges + Q and –Q are placed at x = 0 and x = R respectively as shown in the figure. Which of the following graphs best represents the variation of electric potential V, with distance x





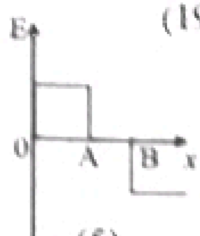
(1994)

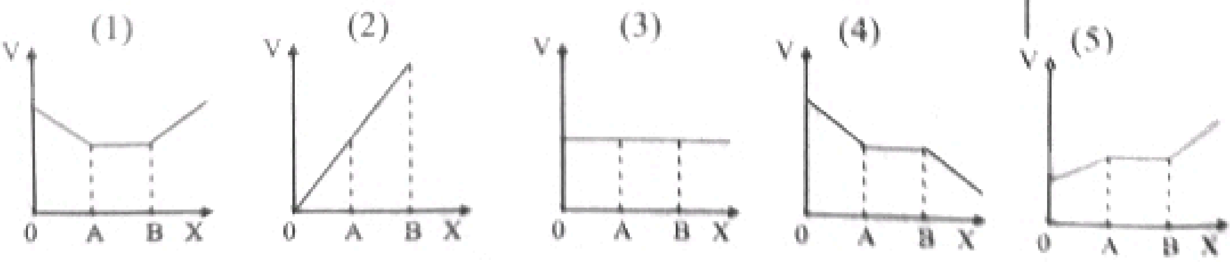
6) A positively charged small sphere is brought down into an uncharged tall metallic container placed on an insulating surface. The sphere is allowed to touch the bottom of the container and then removed without touching it again. Which of the following statements is true?

(1) The container is positively charged on the outside and negatively charged on the inside
(2) The charge is equally divided between the sphere and the container
(3) The sphere will have a negative charge
(4) The sphere retains all of its positive charge
(5) The sphere retains no change.

(1995)

7) Figure shows the variation of electric field intensity E along the direction Ox. The variation of the electric potential V along the same direction is best represented by,





(1995)

8) Which of the following statements regarding electric fields/ potentials is true ?

(1) If the electric field intensity is zero at a point, then the electric potential must also be zero that point

(2) If the electric potential is zero at a point then the electric field intensity must also be zero at that point

(3) If the electric field intensity is zero throughout a region, then the electric potential must also be zero through out that region

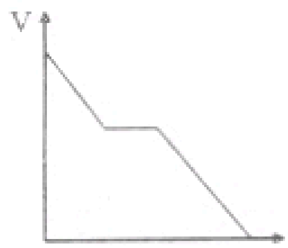
(4) If the electric potential is zero throughout a region, then the electric field intensity must also be zero throughout that region

(5) The electric field intensity is large where the electric potential is large and small where the potential is small. (1996)

9) A charge is distributed uniformly with density σ over the surface of an isolated conducting sphere of radius a. The electric potential at the centre of the sphere is,

1) $\frac{a\sigma}{\varepsilon_0}$ 2) $\frac{a^2\sigma}{\varepsilon_0}$ 3) $\frac{a^2\sigma^2}{\varepsilon_0}$ 4) $\frac{\sigma}{2\varepsilon_0}$ 5) 0 (1999)

10) The figure shows the variation of the electric potential (V) of a system along a particular direction x,



The system can be a charged

(1) parallel plate capacitor with air between the plates

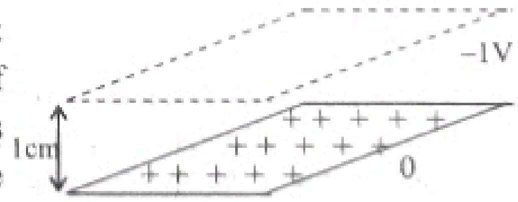
(2) parallel plate capacitor with a metal slab in between the plates

(3) parallel plate capacitor with a dielectric slab in between the plates

(4) conducting sphere

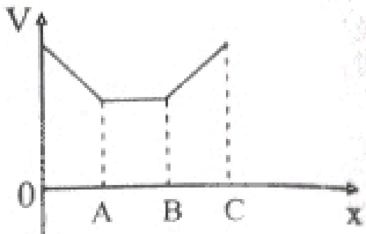
(5) Conducting sphere situated inside a charged concentric spherical conducting shell (1999)

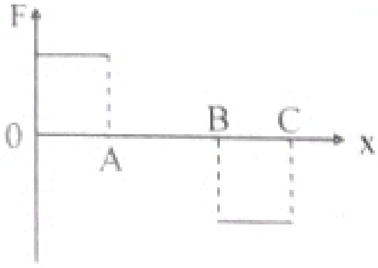
11) A uniformly charged large metal plate is kept at zero potential. An equipotential surface of – 1V is observed at a distance of 1 cm, as shown in the figure. The potential of the equipotential surface at a surface at a distance of 2 cm above the metal plate is,



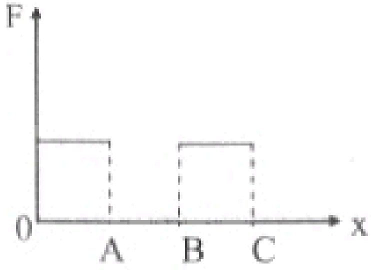
1) – 2V 2) –1V 3) 0.5 V 4) 1V 5) 2V (2000)

12) The variation of the electric potential V along the x-direction in a certain region of space is shown in the figure. If a charge is taken from O to C along the x-direction, the variation of the electric force F acting on the charge is best represented by

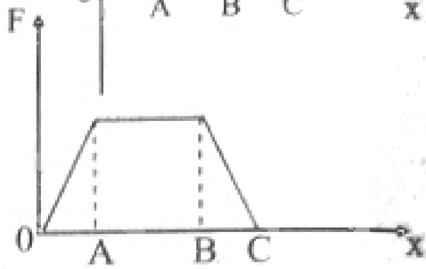




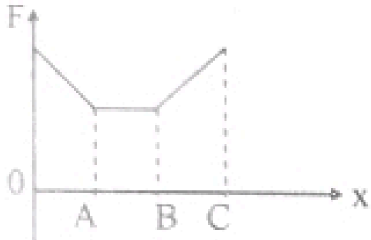
(1)



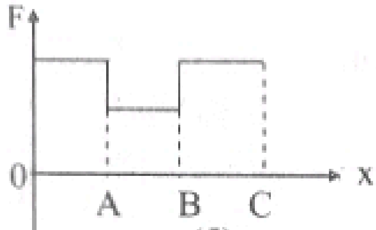
(2)



(3)



(4)



(5)

(2000)

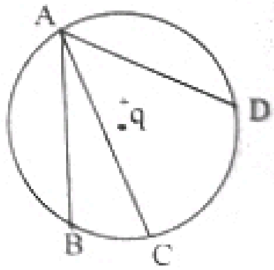
13) eV (electron-volt) is a unit of,

(1) Power (2) energy (3) charge

(4) voltage (5) potential difference

(2001)

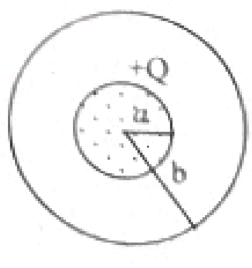
14) A point charge +q is placed at the centre of a circle as shown in the figure. Another point charge +q is carried separately from A to B , A to C, and A to D. The work done in carrying the charge



(1) is least along the path AB
(2) is least along the path AD
(3) is least along the path AC
(4) is same for all the paths, but has a non – zero value
(5) is zero along all the paths

(2002)

15) A solid metal sphere of radius a carrying a charge +Q, is placed concentrically inside an isolated spherical metal shell of radius b as shown in the figure. The electric potential of the solid sphere is,

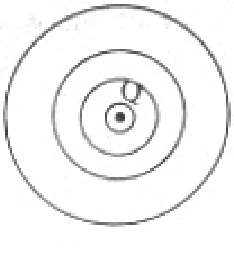


1) $\frac{1}{4\pi\epsilon_0}\frac{Q}{a}$ 2) $\frac{1}{4\pi\epsilon_0}Q\left(\frac{1}{a}-\frac{1}{b}\right)$ 3) 0

4) $\frac{1}{4\pi\epsilon_0}\frac{Q}{b}$ 5) $-\frac{1}{4\pi\epsilon_0}\frac{Q}{a}$

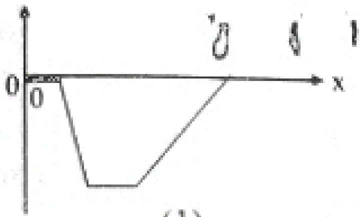
(2003)

16) The figure shows a set of circles centred on a stationary point charge Q. The circles could be used to represent,

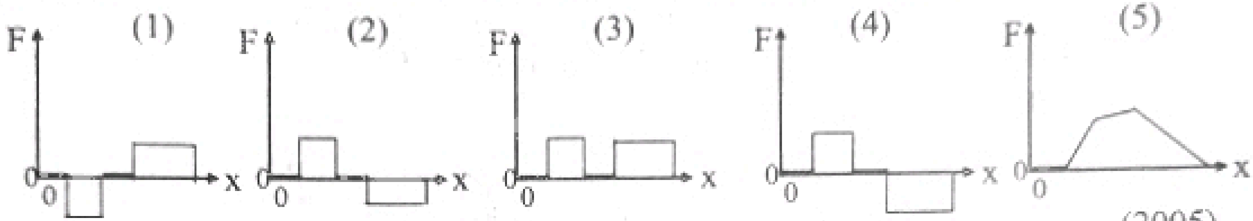


1) the electric field lines.
2) the magnetic field lines.
3) the magnetic equipotential lines.
4) the gravitational field lines.
5) the electric equipotential lines

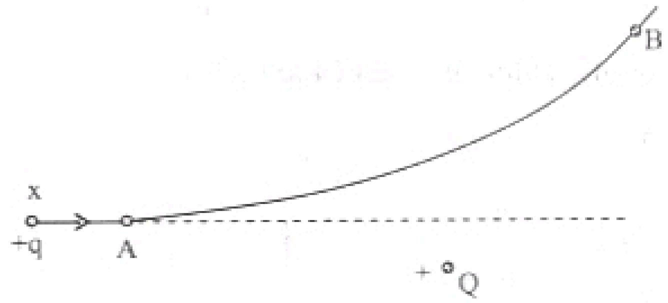
(2005)

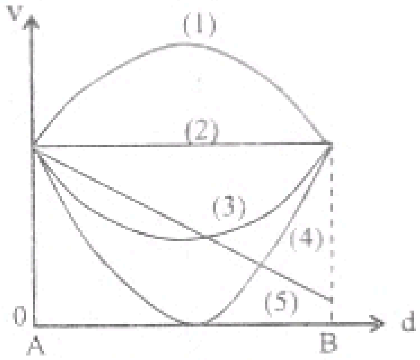
17) 

The graph shows the variation of electric potential V with distance x in a certain region.
The variation of the force F experienced by a positively charged particle with x is best represented by,



(2005)

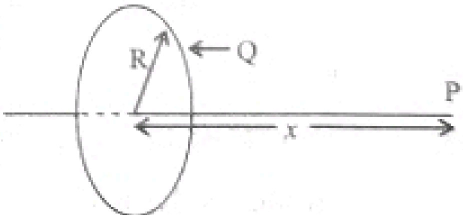
18) 



The figure shows the path of a particle X of charge $+q$ moving in the vicinity of another fixed particle of charge $+Q$. Variation of the speed v of the particle X with the distance d traveled form A along the path AB is best represented by the graph,

1) 1 2) 2 3) 3 4) 4 5) 5 (2005)

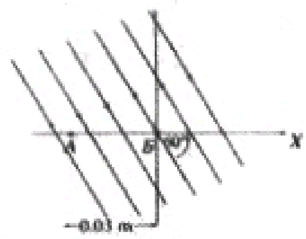
19) A thin conducting ring of radius R has charge Q uniformly distributed over it. P is a point on the axis passing perpendicular to the plane of the ring and through its centre. The electric potential at the point P is given by,



1) $\dfrac{Q}{4\pi\varepsilon_0 x}$ 2) $\dfrac{Q}{4\pi\varepsilon_0 (R^2+x^2)^{\frac{1}{2}}}$ 3) $\dfrac{Q}{4\pi\varepsilon_0 (R^2+x^2)}$

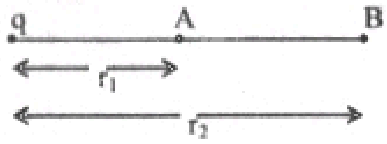
4) $\dfrac{Qx}{4\pi\varepsilon_0 (R^2+x^2)^{\frac{3}{2}}}$ 5) $\dfrac{QR}{4\pi\varepsilon_0 (R^2+x^2)}$ (2006)

20) A uniform electric field of magnitude $400\ \mathrm{Vm^{-1}}$ is acting in the direction as shown in the figure. If V_A and V_B are the electric potentials at points A and B respectively, then $V_B - V_A$ is equal to,



1) – 6V 2) –3V 3) 0 4) 3V 5) 6V (2007)

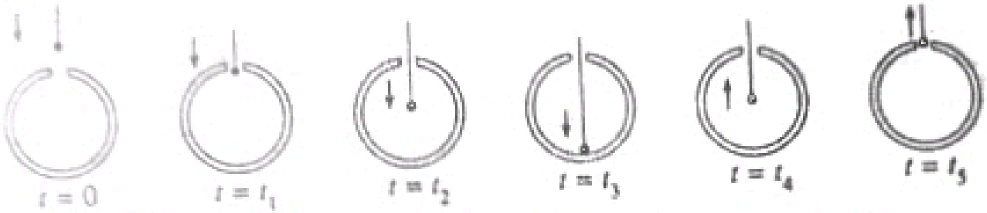
21) A point charge q_0 moves under the influence of the electric field created by another stationary point charge q. The change in the kinetic energy of q_0 when it moves from A to B is,



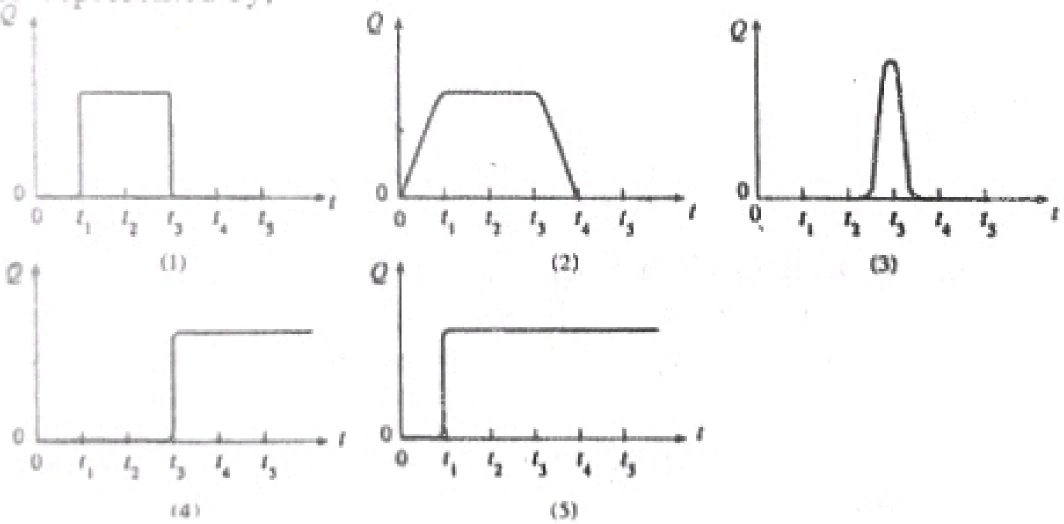
1) $\frac{qq_0}{4\pi\varepsilon_0}\left(\frac{1}{r_1}+\frac{1}{r_2}\right)$ 2) $\frac{qq_0}{4\pi\varepsilon_0}\left(\frac{1}{r_1}-\frac{1}{r_2}\right)$ 3) $\frac{qq_0}{4\pi\varepsilon_0}(r_1+r_2)$

4) $\frac{qq_0}{4\pi\varepsilon_0}\left(\frac{1}{r_1^2}-\frac{1}{r_2^2}\right)$ 5) $\frac{q_0^2}{4\pi\varepsilon_0}\left(\frac{1}{r_1}+\frac{1}{r_2}\right)$ (2008)

22) A small metal ball, suspended by a insulating thread and carrying, a charge q is inserted gradually into an uncharged, conducting hollow sphere through a small hole until it touches the bottom and then it is removed in the same manner. Positions of the metal ball at different times $t = 0$, t_1, t_2, t_3, t_4 and t_5 are shown in the figure.

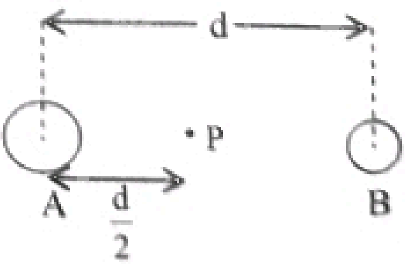


Variation of the charge (Q) on the outer surface of the hollow sphere with time (t) is best represented by,



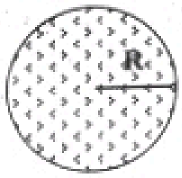
(2008)

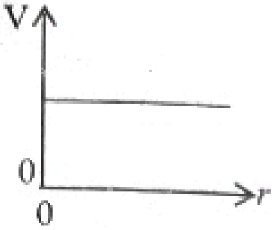
23) A and B are two conducting spheres having radii and $\frac{R}{2}$ respectively, and each carrying a charge +Q. When the two spheres are separated by a distance of (>>R), as shown in the figure, the electric potential at point P is V_0. When these two spheres are connected using a very thin metal wire, the electric potential at P will become.



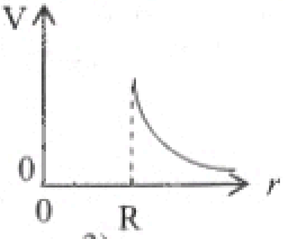
(1) zero (2) $\frac{V_0}{2}$ (3) $\frac{3V_0}{4}$ (4) V_0 (5) $2V_0$ (2010)

24) A non conducting sphere of radius R has a uniform positive charge density distributed within the sphere. The variation of the electric potential (V) with radial distance (r) is best represented by,

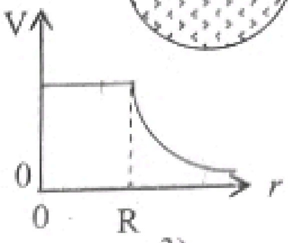




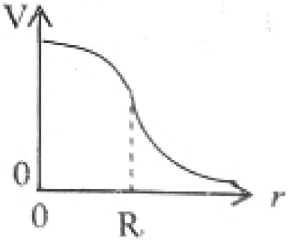
1)



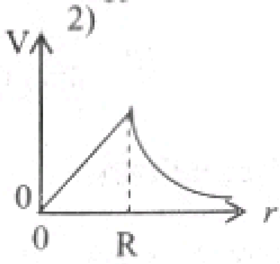
2)



3)



4)



5)

(2011 N)

25) Consider the following statements made about electric fields and equipotential surface.

(A) Electric field lines and equipotential surfaces are always perpendicular to each other.

(B) The magnitude of the electric field intensity should be same at all points on an equipotential surface.

(C) The magnitude of the electric field intensity cannot be zero at a point on an equipotential surface.

Of the above statements.

1) only (A) is true
2) only (B) is true
3) only (A) and (B) are true
4) only (B) and (C) are true
5) all (A), (B) and (C) are true

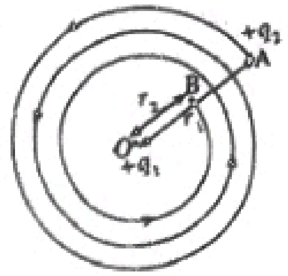
(2013)

26) Two charged conducting spheres of radii $R_1 = r$ and $R_2 = 2r$ are connected by a thin conducting wire. After being connected, if the respective charges on the two spheres are Q_1 and Q_2 and the corresponding surface charge densities on the two spheres are σ_1 and σ_2 respectively, then

1) $\frac{Q_1}{Q_2} = \frac{\sigma_1}{\sigma_2} = \frac{1}{2}$
2) $\frac{Q_1}{Q_2} = \frac{\sigma_1}{\sigma_2} = 2$
3) $\frac{Q_1}{Q_2} = \frac{1}{2}, \frac{\sigma_1}{\sigma_2} = 2$
4) $Q_1 = Q_2, \sigma_1 = \sigma_2$
5) $\frac{Q_1}{Q_2} = 2, \frac{\sigma_1}{\sigma_2} = \frac{1}{2}$

(2014)

27) A point charge of $+q_1$, is held at a point Q. The points A and B are located at distances r_1 and r_2 from O respectively. The work done in bringing another point charge of $+q_2$ from the point A to point B along a spiral path of length l as shown in the figure is,

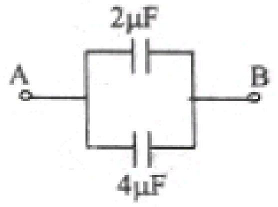


(1) $\frac{q_1q_2}{4\pi\varepsilon_0}\left(\frac{1}{r_2}-\frac{1}{r_1}\right)$ (2) $\frac{q_1q_2}{4\pi\varepsilon_0}\left(\frac{1}{r_1^2}-\frac{1}{r_2^2}\right)l$

(3) $\frac{q_1}{4\pi\varepsilon_0}\left(\frac{q_1-q_2}{r_2^2-r_1^2}\right)l$ (4) $\frac{q_1q_2}{4\pi\varepsilon_0}\left(\frac{1}{r_2}+\frac{1}{r_1}\right)$ (5) $\frac{q_1}{4\pi\varepsilon_0}\left(\frac{q_1}{r_2^2}-\frac{q_2}{r_1^2}\right)l$ (2015)

04. Capacitance and Capacitors

1) When a potential difference of 300 V is applied across AB of the circuit shown, electrical energy stored in the system is,



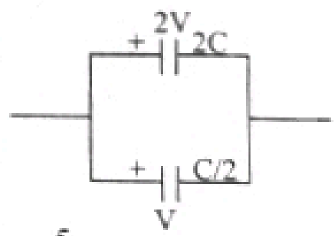
1) 6×10^{-2} J
2) 9×10^{-2} J
3) 1.8×10^{-1} J
4) 2.7×10^{-1} J
5) 5.4×10^{-1} J

(1991)

2) A spherical droplet of mercury of radius R has a capacitance,

1) $4\pi\varepsilon_0 R$ 2) $4\pi R$ 3) $\frac{1}{R}$ 4) $\frac{1}{4\pi R}$ 5) $\frac{1}{4\pi\varepsilon_0 R}$ (1991)

3) Two capacitors having capacities 2C and C/2 are separately charged to potentials 2V and V respectively. If they are isolated from the charging source and then connected in parallel as shown in the figure the resultant potential of the capacitor combination will be



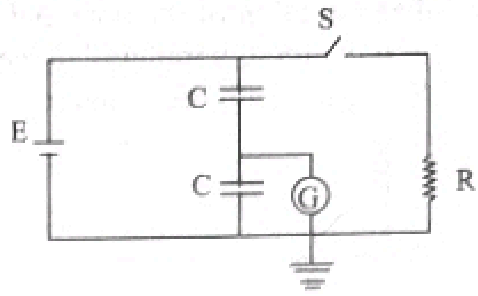
1) V 2) $\frac{3}{2}$V 3) $\frac{9}{5}$V 4) 2V 5) $\frac{5}{2}$V (1992)

4) A parallel plate capacitor is connected to a battery. A dielectric slab is then inserted to fill the gap between the plates of the capacitor while the battery remained connected. If the quantities charge, potential difference, electric field intensity and energy associated with the capacitor before and after inserting the dielectric slab are given by Q_0 V_0 E_0 U_0 and V, E, U respectively then

1) $Q = Q_0,\ V > V_0,\ E > E_0,\ U > U_0$
2) $Q = Q_0,\ V = V_0,\ E < E_0,\ U < U_0$
3) $Q > Q_0,\ V = V_0,\ E = E_0,\ U > U_0$
4) $Q < Q_0,\ V < V_0,\ E = E_0,\ U > U_0$
5) $Q > Q_0,\ V = V_0,\ E < E_0,\ U > U_0$

(1992)

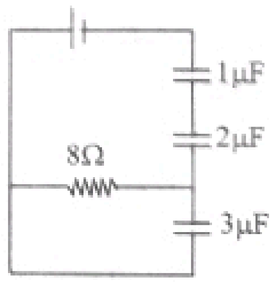
5) In the circuit shown, E is cell with an internal resistance, and G is a sensitive gold leaf electroscope, Both capacitors have the same capacitance which of the following is true regarding the deflection of G when the switch S is open and closed.



(1) G shows a non zero deflection which remains unchanged upon opening and closing of the switch S
(2) G shows a zero deflection whether S is open or closed
(3) G shows a non zero deflection when S is open but becomes zero when S is closed.
(4) G shows a non zero deflection when S is open but it reduces to a lower value when S is closed
(5) G shows a zero deflection when S is open but shows a non zero deflection when s is closed. (1993)

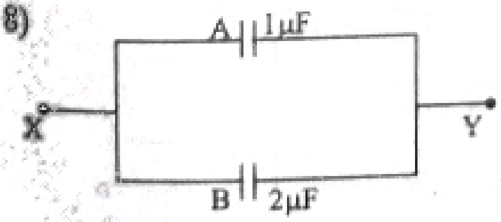
6) Which one of the following statements is true regarding the capacitance of a parallel capacitor
(1) It does not depend of the distance between the plates.
(2) It decreases when a dielectric is placed between the plates.
(3) It is units is $J\ C^{-1}$
(4) It is independent of the charge
(5) It is defined as the energy required to move a unit charge from one plate to the other. (1994)

7) A battery is connected to three capacitors and a resistor as shown in the circuit diagram. If the voltage across the 2μF capacitor is 3 V, the e.m.f. of the battery is



1) 11V. 2) 9V. 3) 6 V
4) 4.5 V 5) 3 V. (1995)

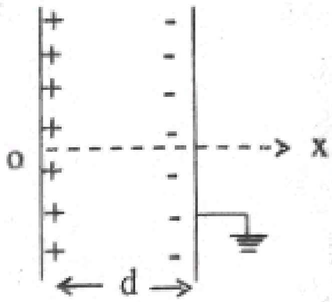
8)

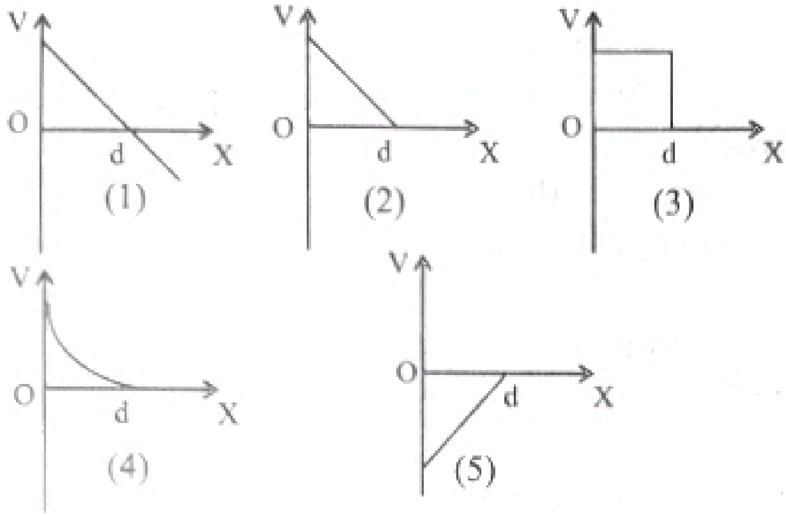


Two capacitors A and B of capacitances 1μF and 2μF are separately charged to potentials 10 V respectively. The oppositely charged plates are then connected together as shown in the figure. The potential difference between X and Y is,

1) 15 V 2) $\frac{20}{3}$ V 3) 5V
4) $\frac{10}{3}$ V 5) 0 (1995)

9) The variation of the potential V along the direction OX due to a charged, parallel plate capacitor placed as show in the figure is best represented by,





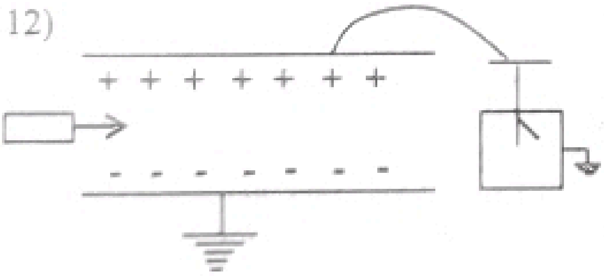
(1996)

10) Each of the metal spheres, A and B of radii 'a' and '2a' respectively carries a +Q charge. If A and B are connected by a metal wire.

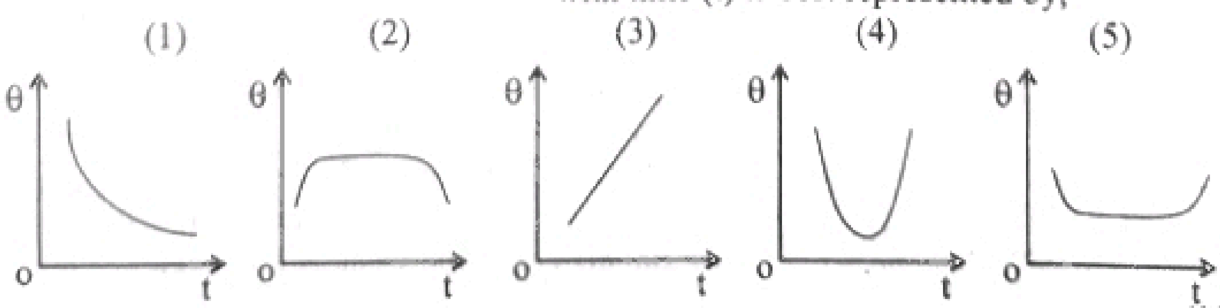
(1) a charge of + 1/Q will flow from A to B
(2) a charge of +Q/3 will flow from B to A
(3) a charge of +Q/3 will flow from A to B
(4) a charge of +Q/2 will flow from B to A
(5) a charge will not flow A to B or B to A (1996)

11) Two identical conducting spheres X and Y carry charges of +97 e and – 100 e respectively. Here e is the charge of an electron. When X and Y are allowed to touch, the final charge on Y is,

1) – 1.5 e or 0   2) – 1.5 e   3) – 3 e or 0
4) – 3 e   5) – 1 e or – 2 e   (1996)

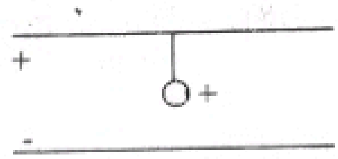
12) 

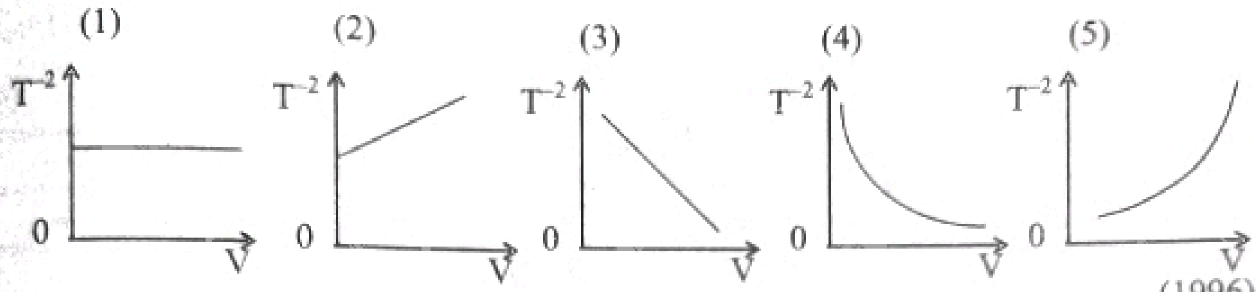
A charged capacitor is connected to the cap of a gold leaf electroscope as shown in the figure. When an uncharged dielectric slab is inserted with a certain velocity from one side and removed from the other side of the capacitor as shown, the variation of deflection (θ) of the leaf with time (t) is best represented by,



(1996)

13) S simple pendulum which caries a positive charge is placed in between the horizontal plates of a parallel plate capacitors, as shown in the figure. If T is the period for small oscillations when a potential difference of V is applied to the capacitor, the variation of T^{-2} with V is best represented by



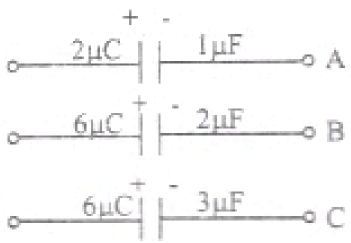


(1996)

14) An isolated parallel plate capacitor filled with air is charged to a potential difference of V. If the space between the plates is then filled with a medium of dielectric constant 2, the potential difference will be,

1) $V/2$ 2) $\frac{V}{\sqrt{2}}$ 3) V 4) $\sqrt{2}\,V$ 5) 2V (1997)

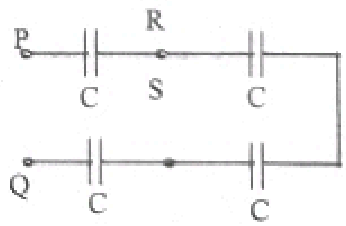
15) Three isolated capacitors having capacitances of 1μF, 2μF and 3μF carry charges 2μC, 6μC and 6μC respectively as shown in the figure. If the positive plates of the capacitors are connected together, the potentials (in volts) at the other plate terminals, A, B and C with respect to the positive plates are,



1) −2, −3, −2 2) 2, 3, 2 3) $\frac{7}{3}, \frac{7}{3}, \frac{7}{3}$

4) $-\frac{7}{3}, -\frac{7}{3}, -\frac{7}{3}$ 5) $\frac{77}{3}, \frac{77}{3}, \frac{77}{3}$ (1997)

16) Four identical capacitors are connected as shown in the figure. The equivalent capacitance across PQ is 0.1μF. If the points R and S are connected by a wire the equivalent capacitance across PQ will become,



1) 0.05 μF 2) 0.1μF 3) 0.2μF
4) 0.3μF 5) 0.4 μF (1998)

17) Three identical metal spheres are supported on three insulating stands. A charge q is given of the first sphere. The first sphere is then momentarily touched with the second sphere and then the second sphere is momentarily touched with the third. Finally, the third sphere is momentarily touched with the first again. The final amounts of charge residing on first, second, and the third spheres respectively are,

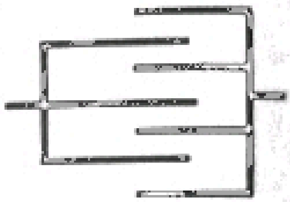
1) $\frac{q}{4}, \frac{q}{4}, \frac{q}{8}$ 2) $\frac{3q}{8}, \frac{q}{4}, \frac{3q}{8}$ 3) $\frac{q}{4}, \frac{q}{2}, \frac{q}{4}$ 4) $\frac{q}{4}, 0, \frac{q}{2}$ 5) $\frac{q}{8}, \frac{3q}{4}, \frac{q}{8}$ (1998)

18) Two spherical conductors with radii R_1 and R_2 are separated by a very large distance and connected by a thin conducting wire. If ε_0 is the permittivity of free space, the capacitance of the system is,

1) $4\pi\epsilon_0(R_1 + R_2)$ 2) $4\pi\epsilon_0 \frac{R_1R_2}{R_1 + R_2}$ 3) $4\pi\epsilon_0 \frac{R_1^2}{R_2}$

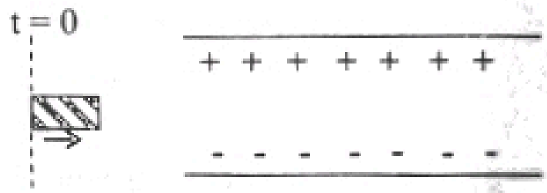
4) $4\pi\epsilon_0(R_1 - R_2)$ 5) $\frac{4\pi\epsilon_0 R_1R_2}{R_1 - R_2}$ (1999)

19) Cross-sectional view of a variable capacitor with parallel plates is shown in the figure. The separation between adjacent plates is 0.5 cm, and the effective area of overlap of adjacent plates is 15 cm^2 If $\varepsilon_0 = 9\times10^{-12} Fm^{-1}$, the capacitance of the variable capacitor at this position is,

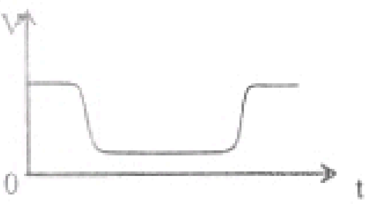


1) 0.15pF 2) 0.3 pF 3) 0.9 pF 4) 2.7 pF 5) 5.4 pF (2000)

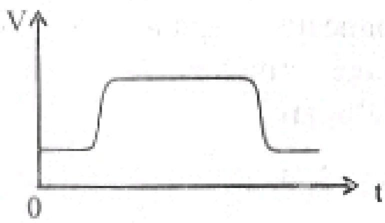
20) A small dielectric slab is passed through an isolated charged parallel plate capacitor, as shown in the figure. As the slab moves the variation of the potential difference V across the capacitor with time t is best represented by,



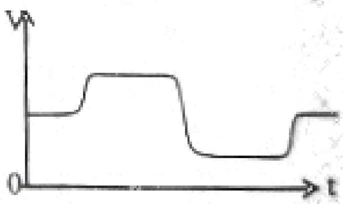
(1)



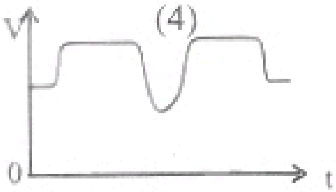
(2)



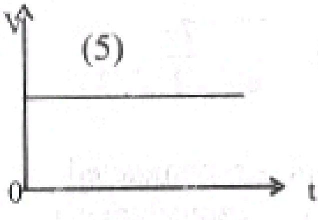
(3)



(4)

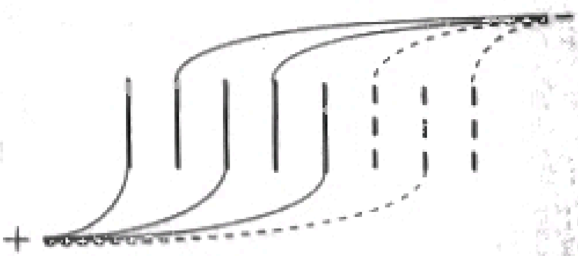


(5)

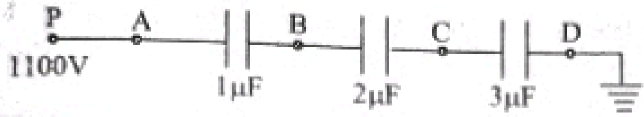


(2000)

21) A capacitor consists of n number of equally spaced, parallel conducting sheets. Alternate sheets connected together compose the positive plate, and the other alternate sheets compose the negative plate as shown in the figure. If A is the area of each sheet and d is the spacing between two adjacent sheets, the capacitance of the arrangement is,



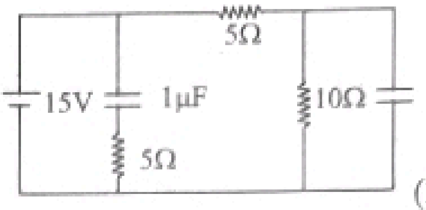
1) $\frac{\varepsilon_0 A}{(n-1)d}$ 2) $\frac{2\varepsilon_0 A}{nd}$ 3) $(n-1)\frac{\varepsilon_0 A}{d}$ 4) $\frac{n\varepsilon_0 A}{d}$ 5) $\frac{\varepsilon_0 A}{nd}$ (2001)

22) 

If the point P is maintained at a constant potential of 1100 V, the potential difference across AB is give by

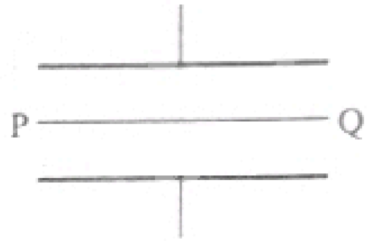
1) $\frac{1100}{6}$V 2) 200V 3) 300V 4) $\frac{1100}{3}$V 5) 600V (2002)

23) In the circuit shown, the charges on the 1μ F and 5μF capacitors are respectively



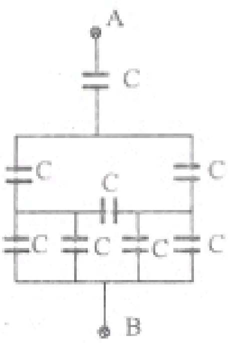
1) 15μC ,75μC 2) 15μC ,50μC
3) 5μC ,25μC 4) 5μC, 50μC
5) 5μC, 10μC (2003)

24) A thin metal plate PQ is inserted between the plates of a parallel plate capacitor of capacitance C, so that it is parallel to the capacitor plates as shown in the diagram. If the area of the plate PQ is same as that of a capacitor plate, the new capacitance of the system will be,



1) $\frac{C}{4}$ 2) $\frac{C}{2}$ 3) C 4) $\frac{3C}{2}$ 5) 2C (2004)

25) The equivalent capacitance between points A and B of the network shown in the diagram is,



1) 8 C 2) 2 C 3) $\frac{7}{3}$C
4) $\frac{3}{2}$C 5) $\frac{4}{7}$C (2004)

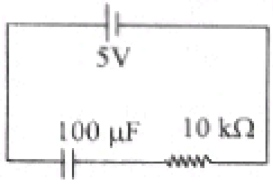
26) A metal sphere of radius r carrying a charge +q is connected by a conducting wire to another metal sphere of radius 2r carrying a charge +q. After the connection, the amount of charge in the sphere of radius r is (Assume that the amount of charge residing in the connecting wire is negligible)

1) 0 2) $+\frac{q}{3}$ 3) $+\frac{q}{2}$ 4) $+\frac{2}{3}q$ 5) $+\frac{3}{2}q$ (2004)

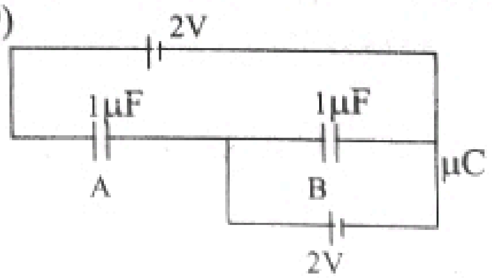
27) A given parallel plate capacitor is connected to a battery. When the e. m. f. of the battery is doubled the electric field between the plates?

1) remains unchanged 2) is half 3) is doubled
4) is quadruped 5) is tripled (2005)

28) A 100μF capacitor connected is series with a 10 kΩ resistor is connected to a 5V battery as shown in the figure. The charge stored in the capacitor in this circuit at the steady state is,



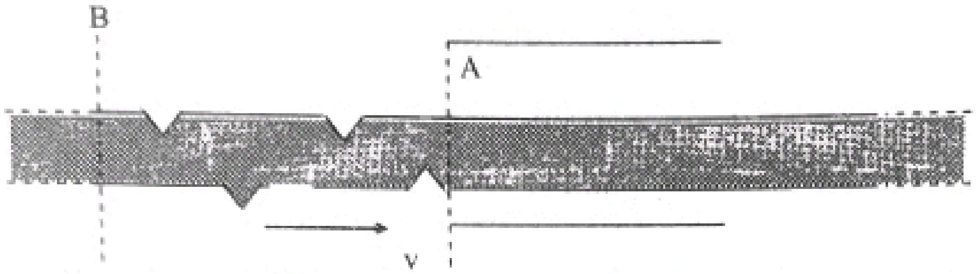
1) 5.0×10^{-5} C 2) 5.0×10^{-4} C 3) 5.0×10^{-3} C
4) 5.0×10^{-2} C 5) 5.0×10^{-1} C (2005)

29) 

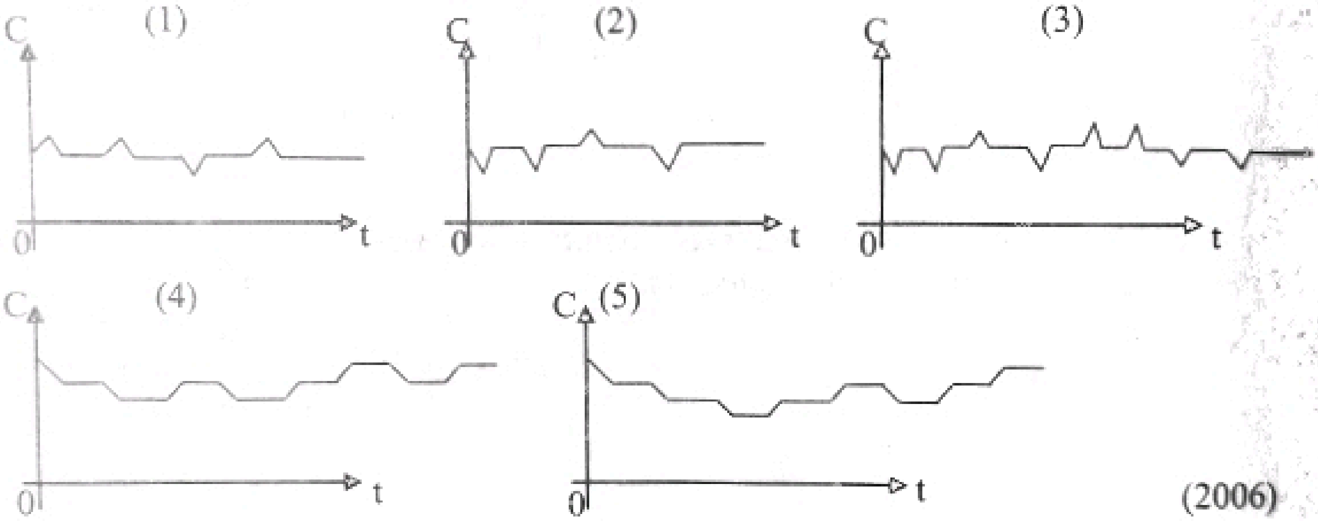
In the circuit shown, charge of the capacities A and B respectively are,

1) 2μC , 2μC 2) 1μC, 2μC 3) 1μC,

4) 0 μC, 2μC 5) 0μC, 4μC (2006)

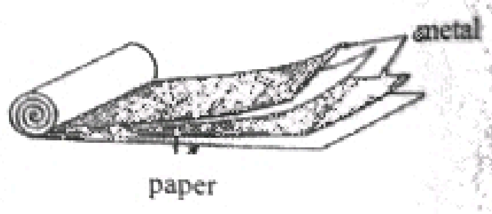
30) 

A uniform sheet of dielectric material is sent through two parallel metal plates as shown in figure at a constant velocity (v) to check manufacturing defects. Some of such defects are shown in the figure. As the section AB of the sheet passes through the metal plates, variation of the capacitance (C) of the system with time (t) is best represented by,



(2006)

31) A cylindrical capacitor is formed by inserting two sheets of paper of dielectric constant 4 and thickness 10^{-4} m, alternately between two rectangular sheets of metal foils, each of length 1m and breadth 10^{-2} m, and rolling them as shown in the figure. ($\varepsilon_0 = 9\times 10^{-12}$ F m^{-1})



The capacitance of the capacitor is,

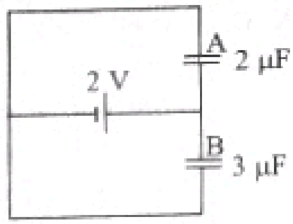
1) 3600 pF 2) 360 pF 3) 36pF 4) 18p 5) 3.6 pF (2007)

32) A spherical liquid drop has an electrical capacitance C_1 and another spherical drop made of the same liquid had a capacitance C_2. If these two liquid drops coalesce to form one spherical drop, the capacitance C of that drop is given by,

1) $C = C_1 + C_2$ 2) $C = \frac{C_1C_2}{C_1 + C_2}$ 3) $C = \left(C_1^3 + C_2^3\right)^{\frac{1}{3}}$

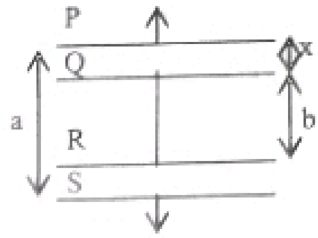
4) $C = \left(C_1^2 + C_2^2\right)^{\frac{1}{2}}$ 5) $C = (C_1C_2)^{\frac{1}{2}}$ (2008)

33) Magnitudes of charge stored in the two capacitors A and B shown in figure respectively are,



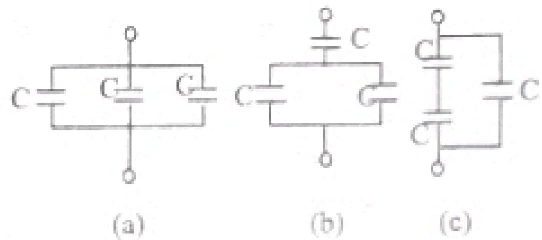
1) 0, 0 2) 0, 6 μC 3) 4 μC, 0
4) 4 μC, 4 μC 5) 4 μC, 6 μC (2009)

34) P, Q, R and S are four parallel conducting plates each of area A, and P and S are fixed plates. Plates Q and R are connected by a rigid conductor as shown in the figure so that they could be moved up and down together. The equivalent capacitance of the system is given by,



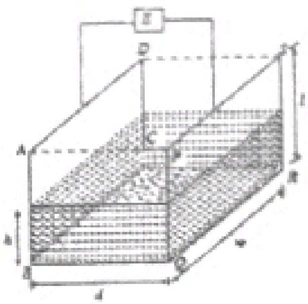
(1) $\frac{\varepsilon_0 A}{a}$ 2) $\frac{\varepsilon_0 A}{a - x}$ 3) $\frac{\varepsilon_0 A}{a + b - x}$ 4) $\frac{\varepsilon_0 A}{a + b + x}$ 5) $\frac{\varepsilon_0 A}{a - b}$ (2010)

35) Three arrangements (a), (b) and (c) made of identical capacitors of capacitance C are shown in the figures. Equivalent capacitances of the arrangements when arranged in ascending order would be,



1) (a), (b), (c) 2) (b), (c), (a) 3) (c), (a), (b)
4) (a), (c), (b) 5) (c), (b), (a) (2011 N)

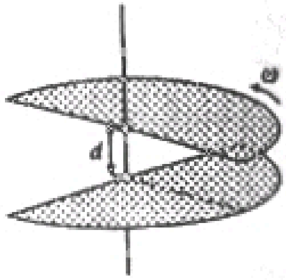
36) A fuel gauge in a vehicle uses a parallel plate capacitor made of two rectangular metal plates to determine the height of the fuel level in the tank. Each of the metal plates (ABCD and PQRS) has a width w and a height l. The height of the fuel level between the plates is h, (see figure). Appropriate electronic circuitry E determines the effective capacitance of the combined air and fuel capacitors. The effective capacitance of this system is given by, (k = dielectric constant of fuel)

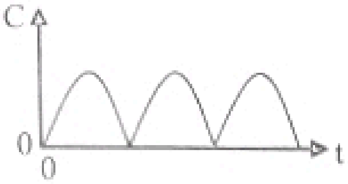


1) $\frac{w\varepsilon_0}{d}[l + h(k - l)]$ 2) $\frac{(l - h)kh\varepsilon_0 w}{d[l + h(k - 1)]}$ 3) $\frac{w\varepsilon_0}{2d}[l + h(k - 1)]$

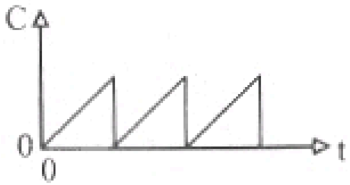
4) $\frac{(l - h)kh\varepsilon_0 w}{2d[l + h(k - 1)]}$ 5) $\frac{k\varepsilon_0 l w}{d}$ (2012 N)

37) A variable parallel plate capacitor is made of two identical semi – circular metal plates that can be rotated about the common axis passing through the centers of each plate and perpendicular to them, as shown in the figure. If one plate rotates with constant angular speed ω, relative to the other, the variation of the capacitance C of the capacitor with time t is best represented by,

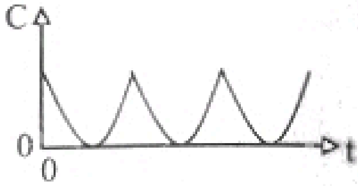




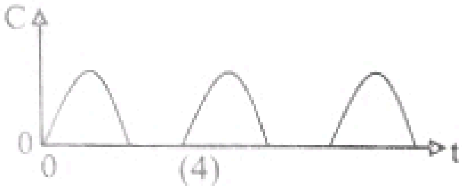
(1)



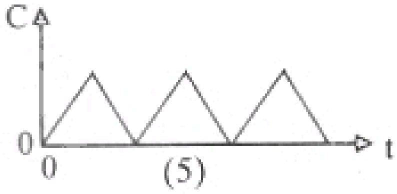
(2)



(3)



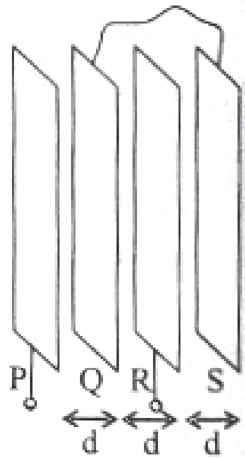
(4)



(5)

(2013)

38) For identical rectangular metal plates, P, Q, R and S have been arranged parallel to each other so that the distance between two successive plates is d. Area of each plate is A. If the plates Q and S are connected by a thin metal wire. What will be the capacitance between plates P and R?



1) $\frac{\varepsilon_0 A}{3d}$ 2) $\frac{2\varepsilon_0 A}{3d}$ 3) $\frac{3\varepsilon_0 A}{2d}$ 4) $\frac{2\varepsilon_0 A}{d}$ 5) $\frac{3\varepsilon_0 A}{d}$ (2013)

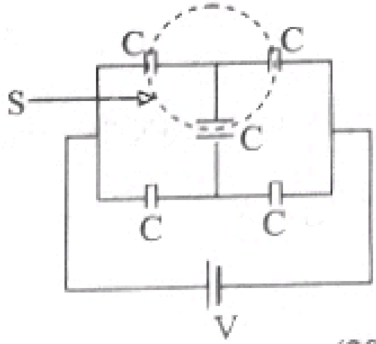
39) If a 1 F air – filled parallel plate capacitor is made by using two metal sheets, each of area A separated by 0.9 cm, the area A would be (Take ε_0 as 9×10^{-12} Fm^{-1})
1) 1 cm^2 (2) 100 cm^2 (3) 1000 m^2 (4) 100 km^2 (5) 1000 km^2 (2015)

40) An air – filled parallel plate capacitor of plate separation d is fully charged using a battery of voltage V_0. Then the battery is removed and the space between the plates of the capacitor is filled with a material of dielectric constant k. If the energy stored in the capacitor when it is filled with air is U_0, and the electric field intensity across the capacitor, and energy stored in the capacitor when it is filled with the dielectric material are E and U respectively, then

1) $E = \frac{V_0}{d}$, $U = kU_0$ 2) $E = \frac{V_0}{kd}$, $U = \frac{U_0}{k}$ 3) $E = \frac{V_0}{kd}$, $U = U_0$

4) $E = \frac{V_0}{kd}$, $U = kU_0$ 5) $E = \frac{V_0}{d}$, $U = \frac{U_0}{k}$ (2015)

41) A network consisting of five identical parallel plate capacitors of capacitance C each, is connected to a cell of voltage V as shown in the figure. Assume that the capacitor plates are in free space. The net electric flux through the enclosed surface S is,



1) $\frac{CV}{2\epsilon_0}$ 2) $\frac{3CV}{5\epsilon_0}$ 3) $\frac{CV}{\epsilon_0}$

4) $\frac{3CV}{\epsilon_0}$ 5) 0 (2016)

42) A 2μF capacitor and a 1μF capacitor are connected in series and charged by a battery. Then the stored energies of the capacitors are E_1 and E_2 respectively. When they are disconnected, allowed to discharge, and charged again **separately** using the same battery, the stored energies of the two capacitors are E_3 and E_4 respectively. Then

1) $E_3 > E_1 > E_4 > E_2$ 2) $E_1 > E_2 > E_3 > E_4$ 3) $E_3 > E_1 > E_2 > E_4$

4) $E_1 > E_3 > E_4 > E_2$ 5) $E_3 > E_4 > E_2 > E_1$ (2016)

ELECTROSTATIC FORCE FIELD

01) Electric Field Intensity and Coulomb's Law

(01)	3	(02)	5	(03)	3	(04)	4	(05)	4
(06)	5	(07)	2	(08)	2	(09)	4	(10)	3
(11)	2	(12)	4	(13)	2	(14)	5	(15)	2
(16)	3, 4	(17)	1	(18)	3				

02) Gauss Theorem

(01)	4	(02)	4	(03)	3	(04)	3	(05)	4
(06)	4	(07)	2	(08)	2	(09)	2	(10)	2
(11)	2	(12)	5	(13)	2	(14)	5	(15)	3
(16)	3	(17)	4	(18)	3	(19)	4	(20)	1
(21)	2	(22)	2	(23)	2				

03) Electrostatic Potential

(01)	4	(02)	1	(03)	4	(04)	3	(05)	5
(06)	5	(07)	1	(08)	4	(09)	1	(10)	2
(11)	1	(12)	1	(13)	2	(14)	5	(15)	1
(16)	5	(17)	2	(18)	3	(19)	2	(20)	1
(21)	2	(22)	5	(23)	4	(24)	4	(25)	1
(26)	3	(27)	1						

04) Capacitance and Capacitors

(01)	4	(02)	1	(03)	3	(04)	3	(05)	4
(06)	4	(07)	2	(08)	5	(09)	2	(10)	1
(11)	5	(12)	5	(13)	2	(14)	1	(15)	1
(16)	3	(17)	2	(18)	1	(19)	5	(20)	1
(21)	3	(22)	5	(23)	2	(24)	3	(25)	5
(26)	4	(27)	3	(28)	2	(29)	4	(30)	4
(31)	1	(32)	3	(33)	5	(34)	5	(35)	2
(36)	1	(37)	5	(38)	2	(39)	5	(40)	2
(41)	5	(42)	5						