PHYSICS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER - 8

Section A

1. A method for charging a conductor without bringing a charged body in contact with it is called

A. electrification.

B. electrostatic induction.

C. magnetisation.

D. electromagnetic induction.

Answer: B

Watch Video Solution

2. Electric flux through closed surface

A. Total charge on the surface

B. Total charge induced on surface

C. Total charge enclosed

D. Total charge outside the gaussian surface

Answer: C

Watch Video Solution

3. The magnetic moment of a circular coil carrying current is

A. $\overrightarrow{M} = 2I\overrightarrow{A}$

B. $\overrightarrow{M} = \frac{I\overrightarrow{A}}{2}$

C. $\overrightarrow{M} = I\overrightarrow{A}$

D. $\overrightarrow{M} = \frac{\overrightarrow{A}}{2I}$

Answer: C

Watch Video Solution

4. Electric Field lines

A. always form a closed loop

B. are superimposed

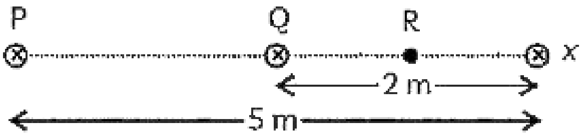
C. can penetrate through conducting surface

D. emerges from negative charge

Answer: B

Watch Video Solution

5. Electron moves along positive x direction with $v = 4 \times 10^{-5}$ m/s experiences force of magnitude 3.2×10^{-20} N at R value of I is:



A. $0.4A$

B. $40A$

C. $4A$

D. $5A$

Answer: C

View Text Solution

6. At certain places, if horizontal and vertical components of earth's magnetic field are equal then the angle of dip is:

A. 0°

B. 45°

C. 60°

D. 90°

Answer: B

Watch Video Solution

7. If a long hollow copper pipe carriers a direct current, the magnetic field associated with the current will be:

A. outside the pipe only

B. inside the pipe only

C. Both (a) and (b)

D. Current will not pass

Answer: A

Watch Video Solution

8. Effective area of coil in a magnetic field changes with time, the flux at any time is:

A. $\phi_B = BA \cot \omega t$

B. $\phi_B = BA \cos \omega t$

C. $\phi_B = BA \tan \omega t$

D. $\phi_B = BA \sec \omega t$

Answer: B

Watch Video Solution

9. How does magnetic moment of electron reducing around the nucleus varies with principal quantum number:

A. $\mu \propto n^2$

B. $\mu \propto \sqrt{n}$

C. $\mu \propto n$

D. $\mu = \frac{1}{n}$

Answer: C

Watch Video Solution

10. Magnetic field of a straight solenoid carrying carried 1 and having a n turns per unit length given by:

A. $B = \frac{\mu_0 n I}{2}$

B. $B = \mu_0 n I$

C. $B = \mu_0 n^2 I$

D. $\frac{\mu_0 n^2 I}{4}$

Answer: B

Watch Video Solution

11. Self-inductance of a coil is 2 mH and rate of current flow is 10^3 A/s. The induced emf is:

A. 1V

B. 2 V

C. 3V

D. 4V

Answer: B

Watch Video Solution

12. If K = 2 then the relation between force in air and force in medium will be:

A. $2F_M = F_A$

B. $4F_M = F_A$

C. $F_M = F_A$

D. $2F_A = F_M$

Answer: A

Watch Video Solution

13. Tesla is a unit of.

A. magnetic flux

B. magnetic induction

C. electric flux

D. electric field

Answer: B

Watch Video Solution

14. The resonance phenomena occurs when the system:

A. Oscillates at a certain frequency

B. Have Rand L only

C. Have L and C

D. Both (a) and (c)

Answer: C

Watch Video Solution

15. Primary and secondary coil of a transformer have 20 and 100 turns respectively. Primary coil is supplied with 220 V dc supply then voltage across secondary coil will be:

A. 1100 V

B. 220 V

C. 11 V

D. 0 V

Answer: A

Watch Video Solution

16. A potentiometer can measure emf of a cell because:

A. the sensitivity of potentiometer is large.

B. no current is drawn from the cell at balance.

C. no current is drawn from the cell at balance.

D. internal resistance of cell is neglected.

Answer: C

Watch Video Solution

17. The ratio of field from right side of B at distance 2 cm to 4 cm.

A. $2 : 1$

B. $1 : 1$

C. $1 : 2$

D. $1 : 12$

Answer: B

View Text Solution

18. The relation of conducting of solid conductor is given by:

A. $\sigma = \frac{ne^2}{m}Z$

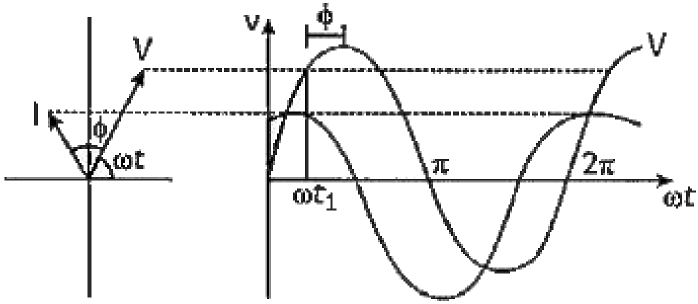
B. $\sigma = \frac{2ne^2}{m}Z$

C. $\sigma = \frac{ne^2}{4m}Z$

D. $\sigma = \frac{ne^2}{2m}Z$

Answer: B

Watch Video Solution

19. 

If L= inductance and R = resistance, then the unit of L/R is:

A. Ampere

B. Sec

C. Volt

D. $\sec^{-1}$

Answer: B

Watch Video Solution

20. In LR circuit, f = 50 Hz, L= 2 H, $\varepsilon = 5V, R = 1\Omega$, then the energy stored in the inductor is:

A. 25 J

B. 50 J

C. 100 J

D. None of these

Answer: D

Watch Video Solution

21. A volt-meter of range 2 V and resistance 300Ω cannot be converted into ammeter of range:

A. 1 mA

B. 10 mA

C. 1A

D. 100 mA

Answer: A

Watch Video Solution

22. Lenz's law applies to:

A. lenses

B. cinema slides

C. atoms

D. electromagnetic induction

Answer: D

Watch Video Solution

23. Two parallel wires carrying current 1 A and 3 A respectively are 1 m apart. If the current is in opposite direction, the force per unit length on both the wires will be:

A. 6×10^{-5} repulsive

B. $6 \times 10^{-5} \frac{N}{m}$ attractive

C. $6 \times 10^{-7} \frac{N}{m}$ repulsive

D. $6 \times 10^{-5} \frac{N}{m}$ attractive

Answer: C

Watch Video Solution

24. Relation between drift velocity of electron, thermal velocity is given by :

A. $v_r = v_d = 0$

B. $v_d = v_r$

C. $v_d > v_r$

D. $v_d < v_r$

Answer: D

Watch Video Solution

25. 2 mA current is flowing through a potentiometer wire of 5m and 5Ω resistance. The potential gradient is :

A. $1.6 \times 10^{-3} \frac{V}{m}$

B. $2 \times 10^{-3} \frac{V}{m}$

C. $2.5 \times 10^{-2} \frac{V}{m}$

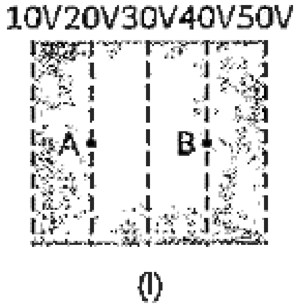
D. $2.3 \times 10^{3} \frac{V}{m}$

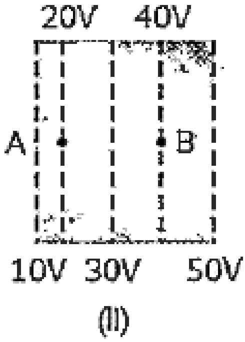
Answer: B

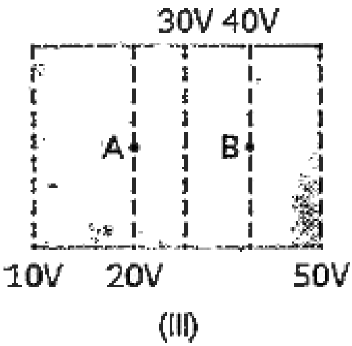
Watch Video Solution

Section B

1. Same equipotential lines distributed in space are shown below. A charged object moves from A to B:







A. Work done is same in fig (I), (II) and (III)

B. Work done is greatest in fig (I)

C. Work done is least in fig (II)

D. Work done in fig (III) is greater then fig (II) but equal to that in fig (I)

Answer: A

View Text Solution

2. Infinite number of charges of $4\mu C$, respectively are placed along the X-axis at 1 m, 2 m, 4 m, 8 m and So. The coulomb field at origin for all these charges is:

A. $4.8 \times 10^6 \frac{N}{C}$

B. $4.8 \times 10^5 \frac{N}{C}$

C. $4.8 \times 10^4 \frac{N}{C}$

D. $4.8 \times 10^3 \frac{N}{C}$

Answer: C

Watch Video Solution

3. If the conductor has $V \neq 0$ with zero charge then:

A. there cannot be any charge in the body of conductor

B. there must be charge on the surface or inside itself

C. there must be charge only on the surface

D. both (a) and (b)

Answer: A

Watch Video Solution

4. If two charges are kept in a material of dielectric constant what is the ratio of force between them:

A. $16:1$

B. $2:1$

C. $4:1$

D. $1:1$

Answer: C

Watch Video Solution

5. What is the power dissipated by a bulb of 100 W - 220 V connected to a 110 V supply:

A. 50 MW

B. 0.5 W

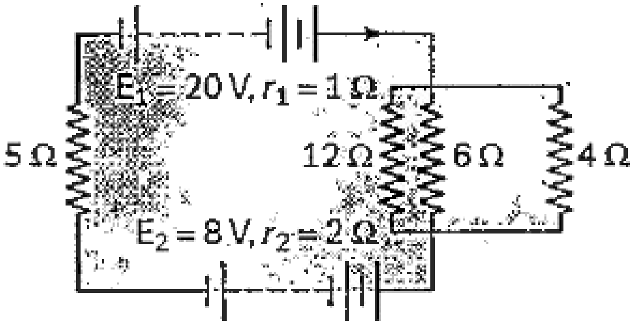
C. 50 W

D. 5 MW

Answer: C

Watch Video Solution

6. Total resistance of the circuit:



A. 10Ω

B. 20Ω

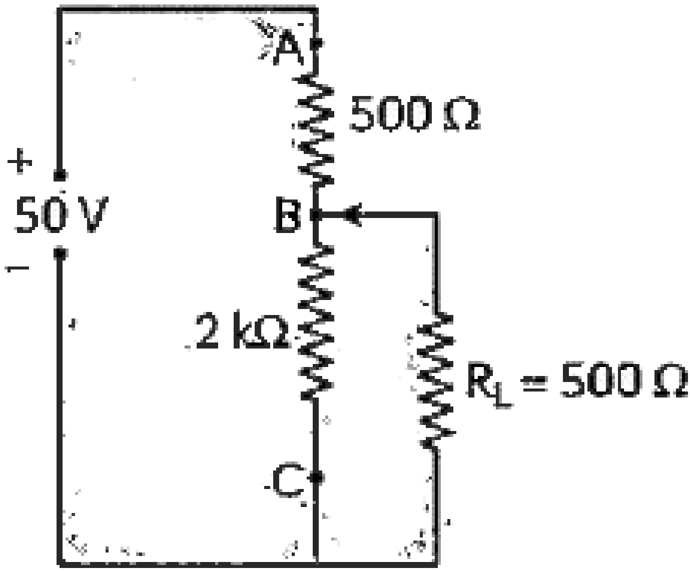
C. 5Ω

D. 15Ω

Answer: A

Watch Video Solution

7. Total current flowing through the circuit:



A. 0.677 A

B. 0.057 A

C. 0.87 A

D. 2.87 A

Answer: B

Watch Video Solution

8. If number of turns in a coil is quadrupled, then self-inductance will be:

A. doubled

B. four times

C. remains the same

D. sixteen times

Answer: D

Watch Video Solution

9. A 1m long calculating rod rotates with an angular frequency of 400 rad s^{-1} an axis normal to the rod passing through its one one end. The other end of the rod is contact with a circular metallic ring. A constant magnetic field of 0.5 T parallel to the axis everywhere.

Calculate the e.m.f. developed between the centre and the ring.

A. 50 V

B. 100 V

C. 200 V

D. 125 V

Answer: B

Watch Video Solution

10. The current in a coil changes from 0 to 2 A in 0.05 sec. If the induced e.m.f is 80 V, the self inductance of the coil is

A. 0.1 H

B. 0.2 H

C. 0.3 H

D. 0.4 H

Answer: B

Watch Video Solution

11. When the current in a coil changes from $8A$ to $2A$ in $3 \times 10^{-2} s$, th emf induced in the coil is $2V$. The self-inductance of coil in mH

A. 5

B. 10

C. 20

D. 1

Answer: D

Watch Video Solution

12. Lenz's law is a consequence of law of conservation of

A. Induced current

B. Induced emf

C. Charge

D. Energy

Answer: D

Watch Video Solution

13. A soap bubble is given a negative charge, then its radius

A. increase

B. remains the same

C. decrease

D. fluctuate

Answer: A

Watch Video Solution

14. Select the correct statement:

(I) Two field lines can not cross each other

(II) Monopoles are responsible for magnetic field

(III) Earth's magnetic field is greater than bar magnet field

A. (II) only

B. (I) and (II)

C. (I) only

D. (III) and (I)

Answer: C

View Text Solution

15. The current through a solenoid when it replaces a bar magnet $A = 2 \times 10^{-4} m^2$ and turns are 1000 but same magnetic moment $(0.04) Am^2$:

A. 4A

B. 2A

C. 3A

D. $1A$

Answer: B

Watch Video Solution

16. A circular coil expands radially in a region of magnetic field and no electromotive force is produced in the coil. This can be because

A. The magnetic field is in the same plane as the circular coil and it may or may not vary.

B. The magnetic field, has a perpendicular (to the plane of the coil) component whose magnitude is decreasing suitably

C. There is constant magnetic field in the perpendicular (to the plane of the coil) direction

D. Both (a) and (b)

Answer: D

Watch Video Solution

17. Voltage across an inductor, capacitor and a resistor is 30 V, 0 V and 60 V respectively in a series LCR circuit then the phase difference between the applied voltage and applied current will be:

A. $\frac{\pi}{2}$

B. $\frac{\pi}{6}$

C. 0

D. $\frac{\pi}{4}$

Answer: C

Watch Video Solution

18. At resonance, what will be the phase difference between voltage and a current in a series LCR circuit connected to an ac source?

A. $\frac{\pi}{2}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{6}$

D. 0

Answer: D

Watch Video Solution

19. When $L = 2H, C = 32\mu F$ and $R = 10\Omega$, then the resonant frequency is:

A. $125 rads^{-1}$

B. $140 rads^{-1}$

C. $130 rads^{1}$

D. $135 rads^{-1}$

Answer: A

View Text Solution

20. Assertion : In a simple battery circuit the point of lowest potential is positive terminal of the battery.

Reason : The current flows towards the point of the higher potential as it flows in such a circuit from the negative the positive terminal.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

C. (A) is true but (R) is false.

D. (A) is false and (R) is also false.

Answer: D

Watch Video Solution

21. Assertion (A): Resistances connected in parallel has higher equivalent resistance.

Reason (R): $R_P = R_1 + R_2 + \ldots. + R_n$

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

C. (A) is true but (R) is false.

D. (A) is false and (R) is also false.

Answer: D

Watch Video Solution

22. Assertion (A) : Conductivity is due to mobile charge carriers of the body.

Reason (R) : Charge is transferred by conduction and acquired by the body.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

C. (A) is true but (R) is false.

D. (A) is false and (R) is also false.

Answer: A

View Text Solution

23. Assertion. When charges are shared between any two bodies, no charge is really lost but some loss of energy does occur.

Reason. Some energy disappears in the from of heat, sparking etc.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

C. (A) is true but (R) is false.

D. (A) is false and (R) is also false.

Answer: C

Watch Video Solution

24. Assertion: Increasing the charge on the plates of a capacitor means increasing the capacitance.

Resion : Capacitance is directly proportinal to charge.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true but (R) is not the correct explanation of (A).

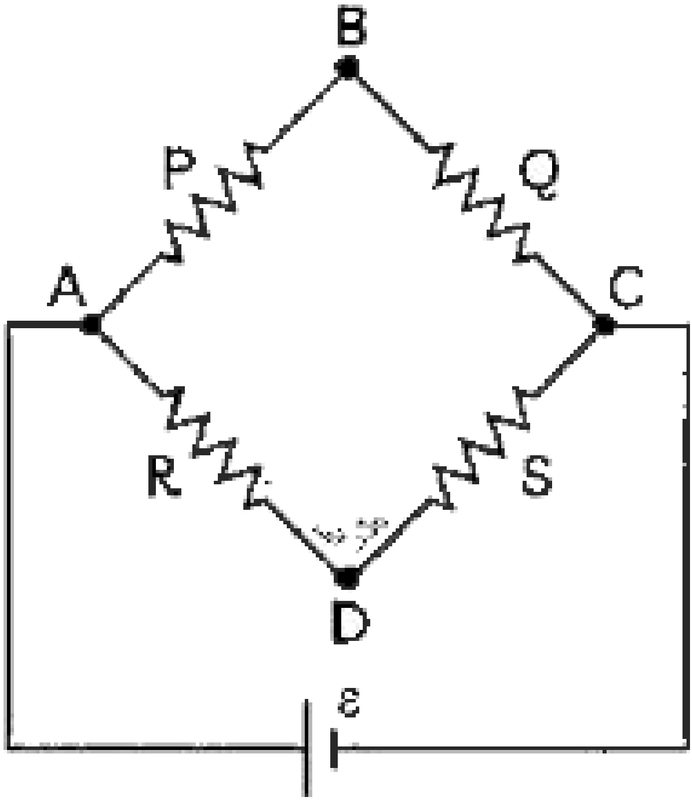
C. (A) is true but (R) is false.

D. (A) is false and (R) is also false.

Answer: D

Watch Video Solution

Section C



1.

If a galvanometer is connected between B and D determine the direction of current :

A. D to B

B. B to D

C. First B to D then D to B

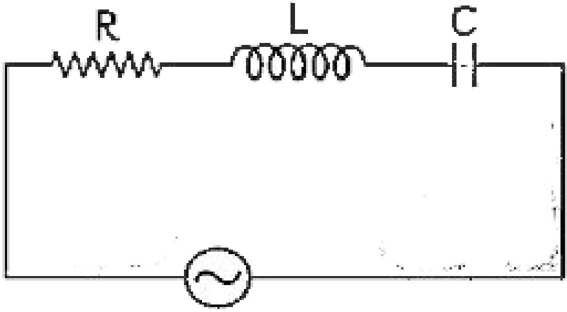
D. Depends on resistance of galvanometer

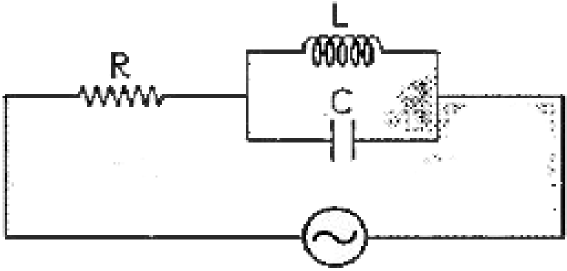
Answer: A

Watch Video Solution

2. The current through given circuit is given by

:





A. $0A, \dfrac{V}{R}$

B. $\dfrac{V}{R}, 0A$

C. $\dfrac{V}{R}, \dfrac{V}{R}$

D. 0, A 0, A

Answer: D

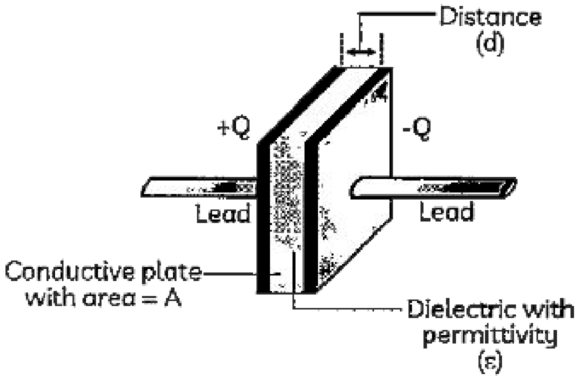
Watch Video Solution

3. Parallel plate capacitor has capacitance $C_0 = \frac{\varepsilon_0 A}{d}$. When a insulating medium is added of dielectric constant K, the capacity becomes $C_m = \frac{\varepsilon A}{d} = K\frac{\varepsilon_0 A}{d} = KC_0$. Let t be the thickness of dielectric such that :

$t(< d)$, then the capacity is $C_d = \frac{\varepsilon_0 A}{d - t\left(1 - \frac{1}{k}\right)}$. For metals, $K = \infty$.

Therefore, when a metal plate of thickness $t < d$ is inctroduced, the capacity becomes

$$C = \frac{\varepsilon_0 A}{d - t}.$$



Which material will increase the capacitance of a capacitor :

A. Zinc

B. Aluminium

C. Copper

D. Mica

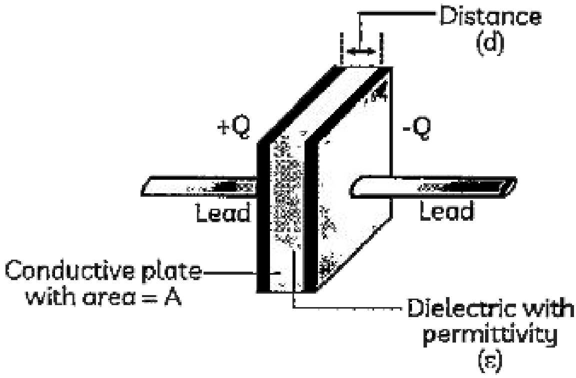
Answer: D

View Text Solution

4. Parallel plate capacitor has capacitance $C_0 = \frac{\varepsilon_0 A}{d}$. When a insulating medium is added of dielectric constant K, the capacity becomes $C_m = \frac{\varepsilon A}{d} = K\frac{\varepsilon_0 A}{d} = KC_0$. Let t be the thickness of dielectric such that :

$t(< d)$, then the capacity is $C_d = \frac{\varepsilon_0 A}{d - t\left(1 - \frac{1}{k}\right)}$. For metals, $K = \infty$.

Therefore, when a metal plate of thickness $t < d$ is inctroduced, the capacity becomes $C = \frac{\varepsilon_0 A}{d - t}$.



If the distance between two parallel plates is doubled and area of the plates is halved, the capacitance increases by :

A. 4

B. 1

C. 2

D. $\frac{1}{4}$

Answer: D

View Text Solution

5. Parallel plate capacitor has capacitance $C_0 = \frac{\varepsilon_0 A}{d}$. When a insulating medium is added of dielectric constant K, the capacity becomes $C_m = \frac{\varepsilon A}{d} = K\frac{\varepsilon_0 A}{d} = KC_0$. Let t be the thickness of dielectric such that :

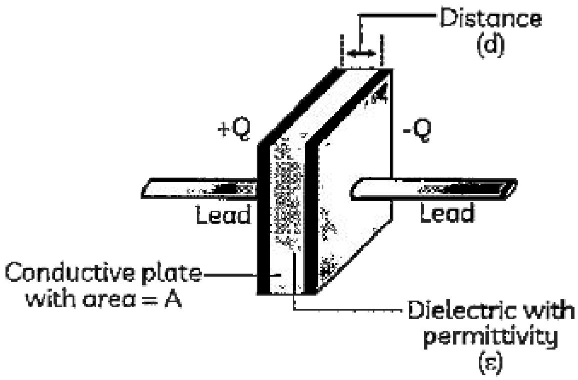
$t(< d)$, then the capacity is

$C_d = \frac{\varepsilon_0 A}{d - t\left(1 - \frac{1}{k}\right)}$. For metals, $K = \infty$.

Therefore, when a metal plate of thickness

$t < d$ is inctroduced, the capacity becomes

$C = \frac{\varepsilon_0 A}{d - t}$.



In a capacitor, a metal plate of thickness

$t = \frac{d}{2}$ is introduced. The increase in its

capacity is :

A. 50%

B. 100%

C. 200%

D. 1%

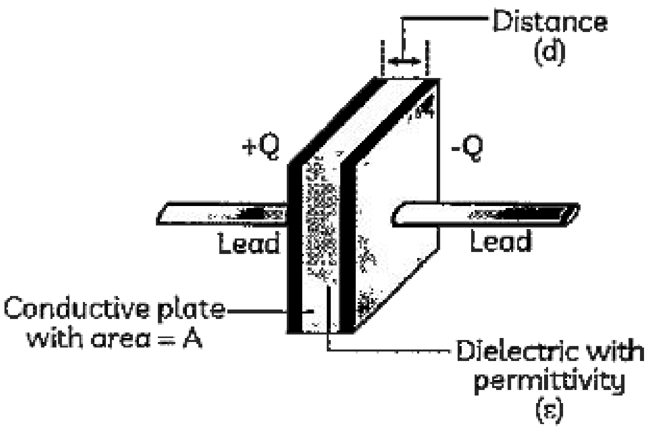
Answer: B

View Text Solution

6. Parallel plate capacitor has capacitance $C_0 = \frac{\varepsilon_0 A}{d}$. When a insulating medium is added of dielectric constant K, the capacity becomes $C_m = \frac{\varepsilon A}{d} = K\frac{\varepsilon_0 A}{d} = KC_0$. Let t be the thickness of dielectric such that :

$t(<d)$, then the capacity is $C_d = \frac{\varepsilon_0 A}{d - t\left(1 - \frac{1}{k}\right)}$. For metals, $K = \infty$.

Therefore, when a metal plate of thickness $t < d$ is inctroduced, the capacity becomes $C = \frac{\varepsilon_0 A}{d - t}$.



By introducing a thin foil between the plates of an air capacitor, the capacitance changes by

:

A. 3C

B. $\frac{C}{2}$

C. C

D. 2C

Answer: C

View Text Solution