NEET PHYSICS

Topic: Capacitance.

Q.1 The capacitance of a metallic sphere will be 1µF, if its radius is nearly-

(1) 9 km
(2) 10 m

(3) 1.11 m
(4) 1.11 cm

Q.2 The energy of a charged conductor is given by the expression-

(1) $\dfrac{q^2}{2C}$
(2) $\dfrac{q^2}{C}$
(3) $2qC$
(4) $\dfrac{q^2}{2C^2}$

Q.3 No current flows between two charged bodies connected together when they have the same-

(1) capacitance or Q/V ratio

(2) charge

(3) resistance

(4) potential or Q/C ratio

Q.4 Two spherical conductors A and B of radii R and 2R respectively are each given a charge Q. When they are connected by a metallic wire. The charge will-

(1) flow from A to B

(2) flow from B to A

(3) remain stationary on conductor

(4) none of these

Q.5 The potential energy of a charged conductor of charge (q) and potential (V) is given by-

(1) $\dfrac{1}{2}\,qV$
(2) $\dfrac{1}{2}\,q^2V$

(3) $\dfrac{1}{2}\,\dfrac{q}{V}$
(4) $\dfrac{1}{2}\,qV^2$

Q.6 A conductor of capacitance 0.5µF has been charged to 100 volts. It is now connected to uncharged conductor of capacitance 0.2µF. The loss in potential energy is nearly -

(1) 7×10^{-4} J
(2) 3.5×10^{-4} J

(3) 14×10^{-4} J
(4) 7×10^{-3} J

Q.7 Two spherical conductors of capacitance 3.0μF and 5.0μF are charged to potentials of 300 volt and 500 volt. The two are connected resulting in redistribution of charges. Then the final potential is -

(1) 300 volt   (2) 500 volt

(3) 425 volt   (4) 400 volt

Q.8 N drops of mercury of equal radii and possessing equal charges combine to form a big spherical drop. Then the capacitance of the bigger drop compared to each individual drop is-

(1) N times   (2) $N^{2/3}$ times

(3) $N^{1/3}$ times   (4) $N^{5/3}$ times

Q.9 The capacity of a parallel plate condenser is C. Its capacity when the separation between the plates is halved will be-

(1) 4C   (2) 2C   (3) C/2   (4) C/4

Q.10 A parallel plate condenser has a capacitance 50μF in air and 110 μF, when immersed in an oil. The dielectric constant K of the oil is-

(1) 0.45   (2) 0.55   (3) 1.10   (4) 2.20

Q.11 The capacity of a parallel plate condenser is 5μF. When glass plate is placed between the plates of the conductor, its potential becomes 1/8th of the original value. The value of dielectric constant will be -

(1) 1.6   (2) 5   (3) 8   (4) 40

Q.12 If the p.d. across the ends of a capacitor 4μF is 1.0 kilovolt. Then its electrical potential energy will be-

(1) 4×10^{-3} erg   (2) 2 erg

(3) 2 joule   (4) 4 joule

Q.13 A 6μF capacitor charged from 10 volts to 20 volts. Increase in energy will be -

(1) 18×10^{-4} J   (2) 9×10^{-4} J

(3) 4.5×10^{-4} J   (4) 9×10^{-9} J

Q.14 The energy of a charged capacitor resides in -

(1) the electric field only

(2) the magnetic field only

(3) both the electric and magnetic field

(4) neither in electric nor magnetic field

Q.15 The capacity and the energy stored in a parallel plate condenser with air between its plates are respectively C_0 and W_0. If the air is replaced by glass (dielectric constant = 5) between the plates, the capacity of the plates and the energy stored in it will respectively be -

(1) $5C_0$, $5W_0$

(2) $5C_0$, $\dfrac{W_0}{5}$

(3) $\dfrac{C_0}{5}$, $5W_0$

(4) $\dfrac{C_0}{5}$, $\dfrac{W_0}{5}$

Q.16 By inserting a plate of dielectric material between the plates of a parallel plate capacitor, the energy is increased five times. The dielectric constant of the material is -

(1) 1/25   (2) 1/5   (3) 5   (4) 25

Q.17 A capacitor of capacity C has charge Q and stored energy is W. If the charge is increased to 2Q the stored energy will be -

(1) 2W   (2) W/2   (3) 4W   (4) W/4

Q.18 A glass slab is put with in the plates of a charged parallel plate condenser. Which of the following quantities does not change?

(1) energy of the condenser

(2) capacity

(3) intensity of electric field

(4) charge

Q.19 A parallel plate capacitor is connected to a battery and inserted a dielectric plate between the place of plates then which quantity increase-

(1) potential difference

(2) electric field

(3) stored energy

(4) E. M . F of battery

Q.20 A parallel plate capacitor is connected to a battery and decreased the distance between the plates then which quantity is same on the parallel plate capacitor-

(1) potential difference

(2) capacitance

(3) intensity of electric field

(4) stored energy

Q.21 A parallel plate capacitor is charged by a battery after charging the capacitor , battery is disconnected. And if a dielectric plate is inserted between the place of plates. Then which one of the following statements is not correct-

(1) increase in the stored energy

(2) decrease in the potential difference

(3) decrease in the electric field

(4) increase in the capacitance

Q.22 A parallel plate capacitor has a capacity C. The separation between plates is doubled and a dielectric medium is inserted between plates. The new capacity is 3C. The dielectric constant of medium is-

(1) 1.5   (2) 3.0   (3) 6.0   (4) 12.0

Q.23 A parallel plate capacitor is charged by a battery after charging the capacitor, battery is disconnected and decrease the distance between the plates then which following statement is correct ?

(1) electric field is not constant

(2) potential difference is increased

(3) decrease the capacitance

(4) decrease the stored energy

Q.24 The capacitance of a parallel plate condenser does not depend upon-

(1) the distance between the plates

(2) area of the plates

(3) medium between the plates

(4) metal of the plates

Q.25 A metallic plate of thickness (t) and face area of one side (A) is inserted between the plates of a parallel plate air capacitor with a separation (d) and face are (A). Then the equivalent capacitance is -

(1) $\dfrac{\epsilon_0\,A}{d}$

(2) $\dfrac{\epsilon_0\,A}{(d\times t)}$

(3) $\dfrac{\epsilon_0\,A}{(d-t)}$

(4) $\dfrac{\epsilon_0\,A}{(d+t)}$

Q.26 An air capacitor of $1\mu\mu F$ is immersed in a transformer oil of dielectric constant 3. The capacitance of the oil capacitor is-

(1) $1\mu\mu F$

(2) $\dfrac{1}{3}\,\mu\mu F$

(3) $3\mu\mu F$

(4) $2\mu\mu F$

Q.27 Two metal plates form a parallel plate condenser. The distance between the plates in d. Now a metal plate of thickness d/2 and of same area is inserted completely between the plates, the capacitance -

(1) remains unchanged

(2) is doubled

(3) is halved

(4) reduced to one fourth

Q.28 The capacity of a parallel plate capacitor with air as medium is $2\mu F$. After inserting a sheet of mica a equal air thickness , it becomes $5\mu F$. The dielectric constant of mica is -

(1) 0.1   (2) 0.4

(3) 2.5   (4) 10

Q.29 A parallel plate capacitor has rectangular plates of 400 cm^2 and are separated by a distance of 2 mm with air as medium. What charge will appear on the plates. If a 200 volt potential difference is applied across the condenser?

(1) 3.54×10^{-6} C   (2) 3.54×10^{-8} C

(3) 3.54×10^{-10} C   (4) 1770.8×10^{-13} C

Q.30 A parallel plate condenser is immersed in an oil of dielectric constant 2. The field between the plates is-

(1) increased proportional to 2.

(2) decreased proportional to 1/2

(3) increased proportional to $\sqrt{2}$

(4) decreased proportional to $1/\sqrt{2}$

ANSWER KEY

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