

FBQ1: What is electric dipole moment per unit volume?

Answer: Polarization

FBQ2: What type of capacitor is used in low loss precision circuit where miniaturisation is important?

Answer: Ceramic

FBQ3: In paramagnetic and diamagnetic materials the magnetisation is maintained by the ____.

Answer: Field

FBQ4: The maximum safe voltage is for a capacitor is called the ____ voltage.

Answer: working

FBQ5: The work done per unit charge is called its ____.

Answer: potential

FBQ6: _____ is the property of an electron that makes it behave as if it were rotating around an axis of its own

Answer: Spin

FBQ7: Diamagnetism involves a change in the _____ of the magnetic moment of an atom.

Answer: Magnitude

FBQ8: Paramagnetism involves a change in the _____ of the magnetic moment of an atom.

Answer: Orientation

FBQ9: Paramagnetism is exhibited by those atoms or molecules in which the _____ magnetic moment is not cancelled.

Answer: Spin

FBQ10: _____ is the magnetic dipole moment per unit volume.

Answer: Magnetisation

FBQ11: _____ is the state of magnetic polarization of a material.

Answer: Magnetisation

FBQ12: What is the dimension of magnetic susceptibility χ_m of a material?

Answer: Dimensionless

FBQ13: The magnetic susceptibility χ_m for a diamagnetic material is ____?

Answer: Negative

FBQ14: The magnetic susceptibility χ_m for a paramagnetic material is ____?

Answer: Positive

FBQ15: Free currents in a _____ material are caused by external current sources.

Answer: Magnetized

FBQ16: Magnetic susceptibility is negative for _____ substances.

Answer: Diamagnetic

FBQ17: The relative permeability K_m for a ferromagnetic material is _____ than unity.

Answer: Greater

FBQ18: The relative permeability K_m for a diamagnetic material is _____ than unity.

Answer: Less

FBQ19: An atom which loses an electron becomes _____?

Answer: A cation

FBQ20: An atom which gains an electron becomes _____?

Answer: An anion

FBQ21: Substances from which electromagnets are made have _____ remanence.

Answer: large

FBQ22: Molecules that acquire a dipole moment only in the presence of an electric field are _____.

Answer: Non- polar

FBQ23: Molecules whose centre of positive charges coincides with the centre of negative charges are _____?

Answer: Polar

FBQ24: Molecules that possess a permanent dipole moment irrespective of the presence of an electric field are _____?

Answer: Polar

FBQ25: _____ is the electric dipole moment per unit volume of a dielectric.

Answer: Polarisation

FBQ26: Two plates of a parallel plate capacitor are 8.85 mm apart and 2.00 m² in area. Compute the capacitance of the parallel plate capacitor. (Take $\epsilon_0 = 8.85 \times 10^{-12}$ F/m).

Answer: 2×10^{-9} F

FBQ27: What is the charge on a parallel plate capacitor with capacitance of 3.54 μ F when a potential difference of 10,000 V is applied across it?

Answer: 0.0354 C

FBQ28: _____ is the SI unit of capacitance?

Answer: Farad

FBQ29: 1 Farad is _____?

Answer: Coulomb / Volt

FBQ30: The capacitance of a parallel plate capacitor _____ with constant cross sectional area A when the space or separation d between them is reduced (provided that the dielectric material between the plates remains unchanged)?

Answer: increases

FBQ31: What happens to the capacitance of a parallel plate capacitor if we increase the distance of separation between the parallel plates of a capacitor by two?

Answer: The capacitance reduces by a factor of 2

FBQ32: The introduction of a dielectric material between the plates of a parallel plate capacitor _____ the capacitance?

Answer: increases

FBQ33: Materials which respond very strongly to the presence of magnetic fields are called _____ materials

Answer: Ferromagnetic

FBQ34: Inside a dielectric, the average electric field is -----than the electric field causing polarisation.

Answer: less

FBQ35: The magnetic dipole moment per unit volume is called _____.

Answer: Magnetisation

MCQ1: Magnetic field intensity H is measured in _____.

Answer: Amperes per metre

MCQ2: The reorientation of a polar material is not perfect due to _____.

Answer: Thermal agitation.

MCQ3: In a dielectric material, the extent of the charge separation depends on the magnitude of the _____.

Answer: Local field

MCQ4: The presence of dielectric led to the modification of _____ law.

Answer: Gauss'

MCQ5: Two capacitors connected in parallel have _____.

Answer: Equal potential difference

MCQ6: _____ is a conductor wound in the form of a coil, with iron core.

Answer: Solenoid

MCQ7: The magnitude of the force F between two charges q_1 and q_2 kept at a distance r in a dielectric medium of permittivity ϵ is given by:

Answer: $|F| = \frac{q_1 q_2}{4\pi\epsilon r^2}$

MCQ8: A parallel plate capacitor has a capacitance of 1.0 F and the plates are 1.0 mm apart. What is the area of the plates? (Take $\epsilon_0 = 8.85 \times 10^{-12}$ F/m)

Answer: $1.13 \times 10^8 \text{ m}^2$

MCQ9: Two plates of a parallel plate capacitor are 8.85 mm apart and 2.00 m^2 in area. Compute the capacitance of the parallel plate capacitor. (Take $\epsilon_0 = 8.85 \times 10^{-12} \text{ F/m}$).
Answer: $2 \times 10^{-9} \text{ F}$

MCQ10: Ferromagnetic materials are used in the cores of transformers that have -----
- hysteresis loop.
Answer: Very wide

MCQ11: The line integral of E around any closed path equals the rate of change of the magnetic flux Φ through the surface enclosed by the path is -----law
Answer: Faraday's

MCQ12: What is the effective capacitance of a parallel arrangement of $4 \mu\text{F}$ and $4 \mu\text{F}$ capacitors?
Answer: $2 \mu\text{F}$

MCQ13: Two point charges $q_1 = 10 \text{ nC}$ and $q_2 = -60 \text{ nC}$ are separated by a distance $r = 6 \text{ cm}$. What is the magnitude of the electric force that q_1 exerts on q_2 ?
Answer: $1.5 \times 10^{-5} \text{ N}$

MCQ14: Conducting materials contain _____ which are free to move about.
Answer: Electrons

MCQ15: A parallel plate capacitor has circular plates of radius 8.2 cm, and 1.3 mm separation. What is its capacitance?
Answer: $1.4 \times 10^{-10} \text{ F}$

MCQ16: The energy stored in a capacitor of capacitance $10 \mu\text{F}$ is 5 J. What is the voltage applied across its terminals.
Answer: 1,000 V

MCQ17: What is the dipole moment of a dipole comprising two charges $q_1 = +8.0 \text{ nC}$ and $q_2 = -8.0 \text{ nC}$ with 100 mm separation?
Answer: $8.0 \times 10^{-10} \text{ Cm}$

MCQ18: How much charge is in a 1F capacitor which has a potential difference of 110V?
Answer: 110 C

MCQ19: Three capacitors of equal capacitance C are connected in series. What is the effective capacitance of the circuit? (Take $\epsilon_0 = 8.85 \times 10^{-12} \text{ F/m}$)
Answer: $C/3$

MCQ20: Calculate the capacitance of a parallel plate capacitor made with two square metal sheets of sides 1.3m, separated by a distance of 0.1m
Answer: $1.5 \times 10^{-10} \text{ F}$

MCQ21: If an atom loses an electron, it becomes which of the following?

Answer: A cation

MCQ22: If an atom gains an electron, it becomes which of the following?

Answer: An anion

MCQ23: The plates of a parallel plate capacitor are separated by a distance. If a dielectric slab is inserted between the plates, the energy stored is _____?

Answer: Decreased

MCQ24: The unit for the energy stored per unit volume in a dielectric medium is _____?

Answer: J/m³

MCQ25: Which of these is true of a local field?

Answer: The local field E_{loc} is directly proportional to the induced dipole moment p .

MCQ26: Which of these is true of paramagnetic materials?

Answer: They get displaced in the direction of increasing field.

MCQ27: Which of these is true of diamagnetic materials?

Answer: They get attracted in the direction of the decreasing field.

MCQ28: The ratio of the magnetic moment and the angular momentum is called _____?

Answer: Gyro-magnetic ratio

MCQ29: Diamagnetism involves a change in the _____ of the magnetic moment of an atom.

Answer: Magnitude

MCQ30: Paramagnetism involves a change in the _____ of the magnetic moment of an atom.

Answer: Orientation

MCQ31: _____ is the magnetic dipole moment per unit volume.

Answer: Magnetisation

MCQ32: Calculate the energy stored in the magnetic field of a 3H inductor which carries a current of 2A.

Answer: 6J

MCQ33: A parallel plate capacitor has a capacitance of 2.8 nF when no dielectric material is present in the separation between the plates. If a material of dielectric constant $K = 3.4$ is now introduced and the capacitor is charged to a voltage of 100V, calculate the energy stored in the capacitor

Answer: 4.8×10^{-5} J

MCQ34: Magnetic fields are due to _____ charges in motion.

Answer: Electric

MCQ35: An example of a diamagnetic material is _____.

Answer: Bismuth