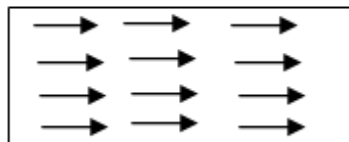




Q1. What are permanent magnets? Give one example.

Answer: A permanent magnet is made up of material which when magnetized retains magnetic field for longer period and has high value of coercivity and remanence or retentivity. The magnetic moment of atoms gets aligned permanently in such a way that resultant magnetic moments of all atoms gives persistent magnetic field even after removal of external magnetic field.

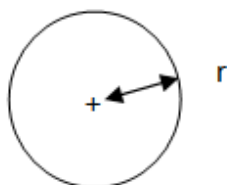


In a permanent magnet, higher magnetic flux obtained with smaller volume of material.

Example: Alloys of aluminium nickel and cobalt (Alnico)

Q2. What is the geometrical shape of equipotential surfaces due to a single isolated charge?

Answer: All points on a sphere around a single isolated charge have same distance r so all have same potential.



Thus each point on the surface of the sphere is equidistant from the charge, therefore geometrical shape of equipotential surface will be concentric sphere such that potential inversely proportional to distance (r).

$$V = \frac{1}{4\pi\epsilon_0} \frac{q}{r}$$



Q3. Which of the following waves can be polarized (i) Heat waves (ii) Sound waves?
Give reason to support your answer.

Answer: Heat waves being electromagnetic wave exhibits polarisation since electric vector oscillates perpendicular to the direction of propagation in all direction. Sound waves cannot be polarised as the direction of oscillation is along the direction of propagation.

Q4. A capacitor has been charged by a dc source. What are the magnitudes of conduction and displacement currents, when it is fully charged?

Answer: When the capacitor is charged initially charge flows and potential of capacitor increased, during charging we will get current called conduction current. Therefore during charging voltage is changing, electric field changes which changes electric flux in the dielectric of the capacitor hence electric flux current density that is displacement current obtained till it is not fully charged.

Once capacitor is fully charged, potential across the plates of capacitor becomes equal to the potential of dc source hence conduction and displacement current both becomes zero.

Q5. Write the relationship between angle of incidence 'i', prism 'A' and angle of minimum deviation for a triangular prism.

Answer: Angle of incidence (i), is related to angle of minimum deviation (δ_m) and angle of prism (A) as

$$i = \frac{A + \delta_m}{2}$$