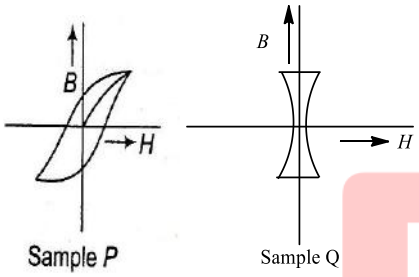
DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 6**

Topic :- MAGNETISM AND MATTER

1. If the $B-H$ curves of two samples of P and Q of iron are as shown below, then which one of the following statements is correct?



a) Both P and Q are suitable for making permanent magnet
b) P is suitable for making permanent magnet and Q for making electromagnet
c) P is suitable for making electromagnet and Q is suitable for permanent magnet
d) Both P and Q are suitable for making electromagnets

2. The magnetic susceptibility of a paramagnetic substance at $-73°$ C is 0.0060, then its value at $-173°$C will be

a) 0.0030 b) 0.0120 c) 0.0180 d) 0.0045

3. A short bar magnet experiences a torque of magnitude 0.64 J. When it is placed in a uniform magnetic field of 0.32 T, taking an angle of 30° with the direction of the field. The magnetic moment of the magnet is
a) 1 Am^2 b) 4 Am^2 c) 6 Am^2 d) None of these
4. Two short magnets with their axes horizontal and perpendicular to the magnetic meridian are placed with their centres 40 cm east and 50 cm west of magnetic needle. If the needle remains undeflected, the ratio of their magnetic moments $M_1 : M_2$ is
a) 4 : 5 b) 16 : 25 c) 64 : 125 d) $2 : \sqrt{5}$
5. The coil in a tangent galvanometer is 16 cm in radius. If a current of 20 mA is to produce a deflection of 45° then the number of turns wound on it, is (Take horizontal component of earth's magnetic field= 0.36×10^{-4} T and $\mu_0 = 4\pi \times 10^{-7}$ Wb A^{-1} m^{-1})
a) 229 b) 458 c) 689 d) 916

6. A deflection magnetometer is adjusted in the usual way. When a magnet is introduced, the deflection observed is θ, and the period of oscillation of the needle in the magnetometer is T. When the magnet is removed, the period of oscillation is T_0.Find the relation between T and T_0 is

   a) $T^2 = T_0^2 \cos\theta$ b) $T = T_0 \cos\theta$ c) $T = \frac{T_0}{cos\theta}$ d) $T^2 = \frac{T_0^2}{cos\theta}$

7. A tangent galvanometer shows a deflection 45° when 10 mA current passes through it. If the horizontal component of the earth's field is $3.6 \times 10^{-5} T$ and radius of the coil is 10 cm. The number of turns in the coil is

   a) 5700 turns b) 57 turns c) 570 turns d) 5.7 turns

8. A small rod of bismuth is suspended freely between the poles of a strong electromagnet. It is found to arrange itself at right angles to the magnetic field. This observation establishes that bismuth is

   a) Diamagnetic b) Paramagnetic c) Ferri-magnetic d) Antiferro-magnetic

9. A magnet performs 10 oscillations per minute in a horizontal plane at a place where the angle o dip is 45° and the total intensity is 0.707 units. The number of oscillations per minute at a place where dip angle is 60° and total intensity is 0.5 CGS units will be

   a) 5 b) 7 c) 9 d) 11

10. Two short magnets have equal pole strengths but one is twice as long as other. The shorter magnet is placed 20 cm in tan A position from the compass needle. The longer magnet must be placed on the other side of the magnetometer for no deflection at a distance equal to

    a) 20 cm b) $20 \times (2)^{1/3}$ cm c) $20 \times (2)^{2/3}$ cm d) $20 \times (2)$ cm

11. In an experiment with vibration magnetometer, the value of $4\pi^2 I/T^2$ for a short bar magnet is observed as 36×10^{-4}. In the experiment with deflection magnetometer with the same magnet, the value of $4\pi d^3/2\mu_0$ is observed as $10^8/36$. The magnetic moment of the magnet used is

    a) 50 A-m b) 100 A-m c) 200 A-m d) 1000 A-m

12. The relative magnetic permeability of ferromagnetic materials is of the order of

    a) 10 b) 100 c) 1000 d) 10000

13. Diamagnetic substance are

    a) Feebly attracted by magnets b) Strongly attracted by magnets
    c) Feebly repelled by magnets d) Strongly repelled by magnets

14. A magnet of length 14 cm and magnetic moment M is broken into two parts of length 6 cm and 8 cm. They are put at a right angle to each other with opposite poles together. The magnetic moment of the combination is

    a) $M/10$ b) M c) $M/1.4$ d) 2.8 M

15. The earth's magnetic induction at a certain point is 7×10^{-5} Wbm^{-2}. This is to be annulled by the magnetic induction at the center of a circular conducting loop of radius 15 cm. The required current in the loop is

    a) 0.56 A b) 5.6 A c) 0.28 A d) 2.8 A

16. A bar magnet is oscillating in the earth's magnetic field with time period T. If its mass is increased four times, then its time period will be
    a) $4T$ b) $2T$ c) T d) $\frac{T}{2}$
17. The deflection magnetometer is most sensitive when deflection θ is
    a) Nearly zero b) Nearly 30° c) Nearly 45° d) Nearly 90°
18. A magnetic dipole is placed in a uniform magnetic field. The net magnetic force on the dipole
    a) Is always zero
    b) Depends on the orientation of the dipole
    c) Can never be zero
    d) Depends on the strength of the dipole
19. Substances in which the magnetic moment of a single atom is not zero, is known as
    a) Diamagnetism
    b) Ferromagnetism
    c) Paramagnetism
    d) Ferrimagnetism
20. When two magnetic moments are compared using equal distance method the deflections produced are 45° and 30°. If the length of magnets are in the ratio 1 : 2, the ratio of their pole strength is
    a) 3 : 1 b) 3 : 2 c) $\sqrt{3} : 1$ d) $2\sqrt{3} : 1$