

DPP

DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Subject : PHYSICS
DPP No. : 9

Topic :- MAGNETISM AND MATTER

- A steel wire of length l has a magnetic moment M . It is bent at its middle point at an angle of 60° . Then the magnetic moment of new shape of wire will be
 - $M/\sqrt{2}$
 - $M/2$
 - M
 - $\sqrt{2}M$
- Let ϕ_1 and ϕ_2 be the angles of dip observed in two vertical planes at right angles to each other and ϕ be the true angle of dip, then
 - $\cos^2 \phi = \cos^2 \phi_1 + \cos^2 \phi_2$
 - $\sec^2 \phi = \sec^2 \phi_1 + \sec^2 \phi_2$
 - $\tan^2 \phi = \tan^2 \phi_1 + \tan^2 \phi_2$
 - $\cot^2 \phi = \cot^2 \phi_1 + \cot^2 \phi_2$
- A dip needle vibrates in the vertical plane perpendicular to magnetic meridian. The time period of vibration is found to be 2 s. The same needle is then allowed to vibrate in the horizontal plane and time period is again found to be 2s. Then the angle of dip is
 - 0°
 - 30°
 - 45°
 - 90°
- At a place, the magnitudes of the horizontal component and total intensity of the magnetic field of the earth are 0.3 and 0.6 *oersted* respectively. The value of the angle of dip at this place will be
 - 60°
 - 45°
 - 30°
 - 0°
- Two identical short bar magnets, each having magnetic moment of 10 Am^2 , are arranged such that their axial lines are perpendicular to each other and their centres be along the same straight line in a horizontal plane. If the distance between their centres is 0.2 m, the resultant magnetic induction at a point midway between them is ($\mu_0 = 4\pi \times 10^{-7} \text{ Hm}^{-1}$)
 - $\sqrt{2} \times 10^{-7} \text{ tesla}$
 - $\sqrt{5} \times 10^{-7} \text{ tesla}$
 - $\sqrt{2} \times 10^{-3} \text{ tesla}$
 - $\sqrt{5} \times 10^{-3} \text{ tesla}$
- The magnetic moment of a diamagnetic atom is
 - Much greater than one
 - 1
 - Between zero and one
 - Equal to zero
- Which one of the following is not a characteristics of diamagnetism?
 - The diamagnetic materials are repelled by a bar magnet
 - The magnetic susceptibility of the materials is small and negative
 - The origin of dia magnetism is the spin of electrons
 - The material move from a region of strong magnetic field to weak magnetic field

8. A short bar magnet with the north pole facing north forms a neutral point a P in the horizontal plane. If the magnet is rotated by 90° in the horizontal plane, the net magnetic induction at P is (Horizontal component of earth's magnetic field = B_H)
- a) Zero b) $2 B_H$ c) $\frac{\sqrt{5}}{2} B_H$ d) $\sqrt{5} B_H$
9. The time period of a freely suspended magnet is 2 sec . If it is broken in length into two equal parts and one part is suspended in the same way, then its time period will be
- a) 4 sec b) 2 sec c) $\sqrt{2} \text{ sec}$ d) 1 sec
10. At a certain place, the angle of dip is 30° and the horizontal component of earth's magnetic field is 0.50 oersted. The earth's total magnetic field (in oersted) is
- a) $\sqrt{3}$ b) 1 c) $\frac{1}{\sqrt{3}}$ d) $\frac{1}{2}$
11. When a metallic plate swings between the poles of a magnet
- a) No effect on the plate
 b) Eddy currents are set inside the plate and the direction of the current is along the motion of the plate
 c) Eddy currents are set up inside the plate and the direction of the current opposes the motion of the plate
 d) Eddy currents are set up inside the plate
12. Which of the following relations is correct in magnetism
- a) $I^2 = V^2 + H^2$ b) $I = V + H$ c) $V = I^2 + H^2$ d) $V^2 = I + H$
13. The time period of a freely suspended bar magnet in a field is 2 s . It is cut into two equal parts along its axis, then the time period is
- a) 4 s b) 0.5 s c) 2 s d) 0.25 s
14. The direction of lines of magnetic field of bar magnet is
- a) From south pole to north pole
 b) From north pole to south pole
 c) Across the bar magnet
 d) From south pole to north pole inside the magnet and from north pole to south pole outside the magnet
15. Two magnets A and B are identical in mass, length and breadth but have different magnetic moments. In a vibration magnetometer, if the time period of B is twice the time period of A . The ratio of the magnetic moments M_A/M_B of the magnets will be
- a) $1/2$ b) 2 c) 4 d) $1/4$
16. Electromagnets are made of soft iron because soft iron has
- a) Low susceptibility and low retentivity b) Low susceptibility and high retentivity
 c) High permeability and low retentivity d) High permeability and high coercivity
17. The permanent magnet is made from which one of the following substances
- a) Diamagnetic b) Paramagnetic c) Ferromagnetic d) Electromagnetic
18. A bar-magnet of moment of inertia $49 \times 10^{-2} \text{ kg} - \text{m}^2$ vibrates in a magnetic field of induction $0.5 \times 10^{-4} \text{ T}$. The time period of vibration is 8.8 s . The magnetic moment of the bar magnet is
- a) $350 \text{ A} - \text{m}^2$ b) $490 \text{ A} - \text{m}^2$ c) $3300 \text{ A} - \text{m}^2$ d) $5000 \text{ A} - \text{m}^2$

19. Unit of magnetic flux density (or magnetic induction) is
- a) *Tesla*
 - b) *Weber/metre²*
 - c) *Newton/ampere – metre*
 - d) All of the above
20. If the magnetic flux is expressed in *weber*, then magnetic induction can be expressed in
- a) *Weber/m²*
 - b) *Weber/m*
 - c) *Weber-m*
 - d) *Weber-m²*

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