

# DPP

DAILY PRACTICE PROBLEMS

Class : XIIth  
Date :

Subject : PHYSICS  
DPP No. : 5

## Topic :- MAGNETISM AND MATTER

1. A vibration magnetometer placed in magnetic meridian has a small bar magnet. The magnet executes oscillations with a time period of 2 sec in earth's horizontal magnetic field of 24 microtesla. When a horizontal field of 18 microtesla is produced opposite to the earth's field by placing a current carrying wire, the new time period of magnet will be  
a) 4s                                      b) 1s                                      c) 2s                                      d) 3s
2. A bar magnet is situated on a table along east-west direction in the magnetic field of earth. The number of neutral points, where the magnetic field is zero, are  
a) 2                                      b) 0                                      c) 1                                      d) 4
3. The magnetic susceptibility of a material of a rod is 499. The absolute permeability of vacuum is  $4\pi \times 10^{-7} \text{ HM}^{-1}$ . The absolute permeability of the material of a rod is  
a)  $\pi \times 10^{-4} \text{ HM}^{-1}$                       b)  $2\pi \times 10^{-4} \text{ HM}^{-1}$                       c)  $3\pi \times 10^{-4} \text{ HM}^{-1}$                       d)  $4\pi \times 10^{-4} \text{ HM}^{-1}$
4. A frog can be levitated in magnetic field produced by a current in a vertical solenoid placed below the frog. This is possible because the body of the frog behaves as  
a) Paramagnetic                      b) Diamagnetic                      c) Ferromagnetic                      d) Anti-ferromagnetic
5. A short bar magnet placed with its axis at  $30^\circ$  with a uniform external magnetic field of 0.16 tesla experiences a torque of magnitude 0.032 J. The magnetic moment of bar magnet will be  
a) 0.23 J/T                                      b) 0.40 J/T                                      c) 0.80 J/T                                      d) Zero
6. Which of the following is represented by the area enclosed by a hysteresis loop ( $B$ - $H$  curve)?  
a) Permeability                                      b) Retentivity  
c) Heat energy lost per unit volume in the sample                                      d) Susceptibility
7. The magnetic potential at a point on the axial line of a bar magnet of dipole moment  $M$  is  $V$ . What is the magnetic potential due to a bar magnet of dipole moment  $\frac{M}{4}$  at the same point  
a)  $4V$                                       b)  $2V$                                       c)  $\frac{V}{2}$                                       d)  $\frac{V}{4}$
8. A wire of length  $L$  metre carrying current  $i$ , ampere is bent in the form of a circle. What is the magnitude of magnetic of magnetic dipole moment?  
a)  $iL^2/4\pi$                                       b)  $i^2L^2/4\pi$                                       c)  $i^2L/8\pi$                                       d)  $iL^2/8\pi$
9. If the magnetic is cut into four equal parts such that their lengths and breadths are equal. Pole strength of each part is  
a)  $m$                                       b)  $m/2$                                       c)  $m/4$                                       d)  $m/8$

10. To shield an instrument from external magnetic field, it is placed inside a cabin made of  
 a) Wood  
 b) Ebonite  
 c) Iron  
 d) Diamagnetic substance
11. The magnetic susceptibility of any paramagnetic material changes with absolute temperature  $T$  as  
 a) Directly proportional to  $T$   
 b) Remains constant  
 c) Inversely proportional to  $T$   
 d) Exponentially decaying with  $T$
12. Magnetic susceptibility of a diamagnetic substance  
 a) Decreases with temperature  
 b) Is not affected by temperature  
 c) Increases with temperature  
 d) First increase then decrease with temperature
13. A very small magnet is placed in the magnetic meridian with its south pole pointing north. The null point is obtained  $20\text{ cm}$  away from the centre of the magnet. If the earth's magnetic field (horizontal component) at this point is  $0.3\text{ gauss}$ , the magnetic moment of the magnet is  
 a)  $8.0 \times 10^2\text{ e.m.u}$   
 b)  $1.2 \times 10^3\text{ e.m.u}$   
 c)  $2.4 \times 10^3\text{ e.m.u}$   
 d)  $3.6 \times 10^3\text{ e.m.u}$
14. Lines which represent places of constant angle of dip are called  
 a) Isobaric lines  
 b) Isogonic lines  
 c) Isoclinic lines  
 d) Isodynamic lines
15. The hysteresis cycle for the material of a transformer core is  
 a) Short and wide  
 b) Tall and narrow  
 c) Tall and wide  
 d) Short and narrow
16. A magnet of magnetic moment  $20\text{ CGS units}$  is freely suspended in a uniform magnetic field of intensity  $0.3\text{ CGS units}$ . The amount of work done in deflecting it by an angle of  $30^\circ$  in CGS units is  
 a) 6  
 b)  $3\sqrt{3}$   
 c)  $3(2 - \sqrt{3})$   
 d) 3
17. Magnetic lines of force due to a bar magnet do not intersect because  
 a) A point always has a single net magnetic field  
 b) The lines have similar charges and so repel each other  
 c) The lines always diverge from a single point  
 d) The lines need magnetic lenses to be made to intersect
18. The angle of dip at a place is  $37^\circ$  and the vertical component of the earth's magnetic field is  $6 \times 10^{-5}\text{ T}$ . The earth's magnetic field at this place is ( $\tan 37^\circ = 3/4$ )  
 a)  $7 \times 10^{-5}\text{ T}$   
 b)  $6 \times 10^{-5}\text{ T}$   
 c)  $5 \times 10^{-5}\text{ T}$   
 d)  $10^{-4}\text{ T}$
19. Hysteresis loss is minimized by using  
 a) Alloy of steel  
 b) Shell type of core  
 c) Thick wire which has low resistance  
 d) Mu metal
20. The distance of two points on the axis of a magnet from its centre is  $10\text{ cm}$  and  $20\text{ cm}$  respectively. The ratio of magnetic intensity at these points is  $12.5 : 1$ . The length of the magnet will be  
 a)  $5\text{ cm}$   
 b)  $25\text{ cm}$   
 c)  $10\text{ cm}$   
 d)  $20\text{ cm}$