DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 10**

Topic :- MAGNETISM AND MATTER

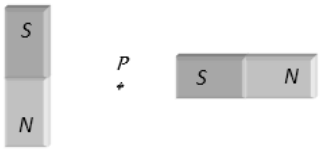
1. A bar magnet when placed at an angle of 30° to the direction of magnetic field induction of 5×10^{-2} T, experiences a moment of couple 25×10^{-6} N $-$ m. If the length of the magnet is 5 cm, its pole strength is

   a) 2×10^{-2} A-m b) 5×10^{-2} A-m c) 2 A-m d) 5 A-m

2. The ultimate individual unit of magnetism is any magnet is called

   a) North pole b) South pole c) Dipole d) Quadrupole

3. Two equal bar magnets are kept as shown in the figure. The direction of resultant magnetic field, indicated by arrow head at the point P is (approximately)



   a) ⟶ b) ↗ c) ↘ d) ↑

4. The radius of the coil of a tangent galvanometer which has 10 turns is 0.1 m. The current required to produce a deflection of 60° ($B_H = 4 \times 10^{-5}$ T) is

   a) 3 A b) 1.1 A c) 2.1 A d) 1.5 A

5. The magnetic field due to a short magnet at a point on its axis at distance X cm from the middle point of the magnet is 200 $gauss$. The magnetic field at a point on the neutral axis at a distance X cm from the middle of the magnet is

   a) 100 $gauss$ b) 400 $gauss$ c) 50 $gauss$ d) 200 $gauss$

6. Among the following properties describing diamagnetism identify the property that is wrongly stated

   a) Diamagnetic material do not have permanent magnetic moment
   b) Diamagnetism is explained in terms of electromagnetic induction
   c) Diamagnetic materials have a small positive susceptibility
   d) The magnetic moment of individual electrons neutralize each other

7. For a paramagnetic material, the dependence of the magnetic susceptibility X on the absolute temperature is given as

   a) $X \propto T$ b) $X \propto 1/T^2$ c) $X \propto 1/T$ d) Independent

8. The magnetic field at a point x on the axis of a small bar magnet is equal to the field at a point y on the equator of the same magnet. The ratio of the distances of x and y from the centre of the magnet is

a) 2^{-3} b) $2^{-1/3}$ c) 2^{3} d) $2^{1/3}$

9. The magnetic induction in air at a distance d from an isolated point pole of strength m unit will be

a) $\frac{m}{d}$ b) $\frac{m}{d^2}$ c) md d) md^2

10. The magnetic field of earth is due to

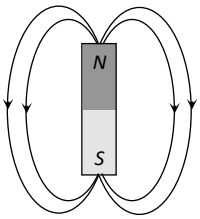
a) Motion and distribution of some material in and outside the earth

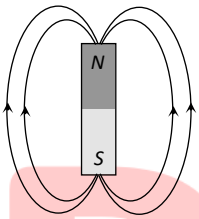
b) Interaction of cosmic rays with the current of earth

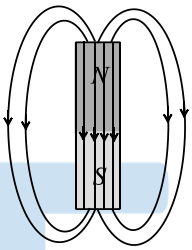
c) A magnetic dipole buried at the centre of the earth

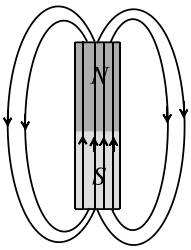
d) Induction effect of the sun

11. The magnetic field lines due to a bar magnet are correctly shown in

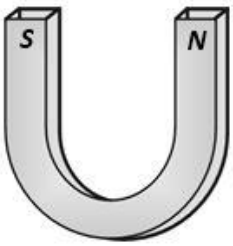
a) 

b) 

c) 

d) 

2. The distance between the poles of a horse shoe magnet is 0.1 m and its pole strength is 0.01 $amp\text{-}m$. The induction of magnetic field at a point midway between the poles will be



a) $2 \times 10^{-5} T$ b) $4 \times 10^{-6} T$ c) $8 \times 10^{-7} T$ d) Zero

13. A bar magnet 20 cm in length is placed with it south pole towards geographic north. The neutral points are situated at a distance of 40 cm from centre of the magnet.
If horizontal component of earth's field $= 3.2 \times 10^{-5}$ T, then pole strength of magnet is

a) 5 AM b) 10 AM c) 45 AM d) 20 AM

14. If two identical bar magnets, each of length l, pole strength m and magnet moment M, are placed perpendicular to each other with their unlike poles in contact, the magnetic moment of the combination is

a) $\frac{M}{\sqrt{2}}$ b) $lm(\sqrt{2})$ c) $2lm(\sqrt{2})$ d) $2M$

15. Which of the following is diamagnetic

a) Aluminium b) Quartz c) Nickel d) Bismuth

16. A bar magnet of magnetic moment $\vec{M}$ is placed in a magnetic field of induction $\vec{B}$. The torque exerted on it is

a) $\vec{M}.\vec{B}$ b) $-\vec{M}.\vec{B}$ c) $\vec{M} \times \vec{B}$ d) $\vec{B} \times \vec{M}$

17. A short magnet of moment 6.75 Am^2 produces a neutral point on its axis. If horizontal component of earth's magnetic field is $5 \times 10^{-5} Wb/m^2$, then the distance of the neutral point should be

a) 10 cm b) 20 cm c) 30 cm d) 40 cm

18. The magnetic susceptibility is

a) $\chi = \frac{I}{H}$ b) $\chi = \frac{B}{H}$ c) $\chi = \frac{M}{V}$ d) $\chi = \frac{M}{H}$

19. A vibration magnetometer consists of two identical bar magnets placed one over the other such that they are perpendicular and bisect each other. The time period of oscillation in a horizontal magnetic field is $2^{2/5}$s. One of the magnets is removed and if the other magnet oscillates in the same field , then the time period in second is

a) $2^{1/4}$ b) $2^{1/2}$ c) 2 d) 4

20. A bar magnet having centre O has a length of 4 cm. Point P_1 is in the broad side-on and P_2 is in the end side-on position with $OP_1 = OP_2 = 10$ $metres$. The ratio of magnetic intensities H at P_1 and P_2 is

a) $H_1 : H_2 = 16 : 100$ b) $H_1 : H_2 = 1 : 2$ c) $H_1 : H_2 = 2 : 1$ d) $H_1 : H_2 = 100 : 16$