ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION TO WORK SHEET 24

Subject : PHYSICS

CLASS : XII

29.6.20

Chapter : Magnetic properties of materials

Topic: Pole strength of a magnet, dipole moment, **B** at end on position, **B** at broad side on position.

Multiple Choice Questions : **1x 15 = 15**

1. SI unit of magnetic pole strength is

   (a) Am^{-1} (b) Am (c) Am^{2} (d) Am^{-2}

   Ans. (b) Am

2. SI unit of magnetic moment

   (a) Am^{2} (b) Am^{-2} (c) Am (d) Am^{-1}

   Ans. (a) Am^{2}

3. A magnetised steel wire is of length 31.3 cm and its pole strength 5 cgs unit. If it is bent into a semi-circle what will be its magnetic moment ?

   (a) 0.5 cgs (b) 5 cgs (c) 50 cgs (d) 100 cgs

   Ans. (d) 100 cgs

4. The magnetic moment of a magnetised wire is M. It is bent in shape of L having sides 4 cm. and6 cm. What will be its magnetic moment now ?

   (a) 0.72 M (b) 0.42 M (c) 0.52 M (d) 0.62 M

   Ans. (a) 0.72 M

5. Torque acting of a magnet held at angle θ with a magnetic field is maximum, when $\theta = 0$.

   (a) 0^{0} (b) 90^{0} (c) 180^{0} (d) 360^{0}

   Ans. (b) 90^{0}

6. SI unit of magnetic flux density (B) is

   (a) JT^{-1} (b) Am (c) Tesla (d) Am^{2}

   Ans. (c) Tesla

7. A current loop placed in a magnetic field behaves like a

   (a) Magnetic dipole (b) Magnetic substance (c) Magnetic pole (d) all are true

   Ans. (a) Magnetic dipole

8. The magnetic moment of a current I carrying circular coil of radius *r* and number of turns n varies as

(a) $\frac{1}{r^2}$ (b) $\frac{1}{r}$ (c) r (d) r^2

Ans. (d) r^2

9. An are of a circle of radius *R* subtends an angle $\frac{\pi}{2}$ at the centre. It carries a current I. The magnetic field at the centre will be

(a) $\frac{\mu_0 I}{2R}$ (b) $\frac{\mu_0 I}{4R}$ (c) $\frac{\mu_0 I}{8R}$ (d) $\frac{2\mu_0 I}{5R}$

Ans. (c) $\frac{\mu_0 I}{8R}$

10. The force between two short bar magnets with magnetic moments M_1 and M_2 whose centres are *r* meter apart is 8N. when their axes are in same line. If the separation is increased to 2*r,* the force between them is reduced to

(a) 4N (b) 2N (c) IN (d) 0 .5N

Ans. (d) 0 .5N

11. Magnetic dipole moment is a vector quantity directed from

(a) south to north (b) north to south (c) east to west (d) west to east

Ans. (a) south to north

12. If a current *I* flows through a loop of area *A* and the strength of the pole thud generated be q_m, the magnetic moment of the loop is

(a) *IA* (b) IA^2 (c) $q_m A$ (d) $q_m A^2$

Ans. (a) *IA*

13. The torque acting on a bar magnet of magnetic moment *M* in a uniform magnetic field *B* will be

(a) $MB \sin\theta$ (b) $MB / \sin\theta$ (c) $MB \cos\theta$ (d) $MB / \cos\theta$

Ans. (a) $MB \sin\theta$

14. When a magnet is placed in a uniform magnetic field, it experiences

(a) a force but no torque (b) a torque but no force
(c) a force and also a torque (d) neither a force nor a torque

Ans. (b) a torque but no force

15. The ultimate individual unit of magnetism is called

(a) north pole (b) south pole
(c) dipole (d) quadrapole

Ans. (c) dipole