ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

WORK SHEET 22

Subject : PHYSICS

24.6.20

CLASS : XII

Chapter : Electromagnetism

Topic : Force on a current carrying conductor, torque on a current carrying loop by **B**, force on parallel current carrying conductors.

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

1. The current carrying wire is at right angle with a uniform magnetic field, then the force acting on the wire will be

   (a) F = Bil (b) F = O (c) $F = \frac{Bi}{l}$ (d) F = 2.Bil

2. The current carrying wire is parallel to the magnetic field, then the force acting on to wire is

   (a) F = Bil (b) F = O (c) $F = \frac{Bi}{l}$ (d) F = 2.Bil

3. The direction of deflection of a current carrying conductor placed perpendicularly in a magnetic field is given by

   (a) Fleming's right hand rule (b) Dynamo rule

   (c) Fleming's left hand rule (d) both (a) and (b)

4. The machine which converts electrical energy to mechanical energy is called

   (a) dynamo (b) motor (c) charger (d) none of the above

5. Torque on a current loop in a uniform magnetic field depends on

   (a) area of the coil (b) shape of the coil

   (c) both (a) and (b) (d) none of the above

6. Vector form of torque on a current loop in a uniform magnetic field is

   (a) $\vec{\tau} = \vec{M} \times \vec{B}$ (b) $\vec{\tau} = \vec{B} \times \vec{M}$ (c) $\vec{\tau} = \vec{M}.\vec{B}$ (d) $\vec{\tau} = \frac{\vec{M}}{\vec{B}}$

7. Magnitude of force of attraction or repulsion between two parallel current carrying conduction is given by

   (a) $F = \frac{\mu_o}{4\pi}.\frac{2i_1i_2}{r}$ (b) $F = \frac{4\pi}{\mu_o}.\frac{2i_1i_2}{r}$ (c) F = O (d) $F = \mu_o.\frac{2i_1i_2}{r}$

8. Force of attraction prevails between two parallel current carrying conductors when

   (a) current flows in opposite direction (b) current flows in same direction

   (c) current flows only in one conductor (d) none of the above

9. A circular coil of 25 turns and radius 12 cm is placed in a uniform magnetic field of 0.5 T normal to the plane of the coil. If the current in the coil is 6A, then total torque acting on the coil is

   (a) zero (b) 3.4N m (c) 3.8 N m (d) 4.4 N m

10. Magnetic moment (or magnetic dipole moment) of a current-carrying coil is given by

(a) $\mathbf{m} = INA$ (b) $\mathbf{m} = \frac{I}{A}$ (c) $\mathbf{m} = NA$ (d) $\mathbf{m} = \frac{NI}{A}$

11. Aloop of flexible wire of irregular shape carrying current is placed in an external field. Then,

(a) it rotates in a direction perpendicular to its axis

(b) it rotates along an axis perpendicular to its plane

(c) it does not show any change

(d) it assumes a circular shape

12. Magnetic field at the centre of a circular loop of area A is B. The magnetic moment of the loop will be

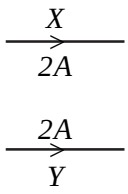
(a) $\frac{BA^2}{\mu_0\pi}$ (b) $\frac{BA^{3/2}}{\mu_0\pi}$ (c) $\frac{BA^{3/2}}{\mu_0\pi^{1/2}}$ (d) $\frac{2BA^{3/2}}{\mu_0\pi^{1/2}}$

13. If a long hollow copper pipe carries a direct current, the magnetic field associated with the current will be

(a) only inside the pipe (b) only outside the pipe

(c) neither inside nor outside the pipe (d) both inside and outside the pipe

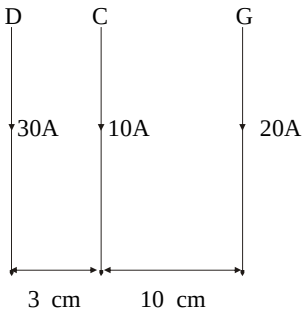
14. In given figure, X and Y are two long straight parallel conductors each carrying current of 2A. The force on each conductor is F newtons. When the current in each changed to 1A and reversed in direction, the force on each is now :



(a) F/4 and unchanged in direction (b) F/2 and reversed in direction

(c) F/2 and unchanged in direction (d) F/4 and reversed in direction

15. Three long, straight and parallel wires C, D and G carrying currents are arranged as shown in figure. The force experienced by 25 cm length of wire C is :



(a) 0.4 N (b) 0.04 N (c) 4 x 10^{-3}N (d) 4 x 10^{-4} N

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