

# O P JINDAL SCHOOL, SAVITRINAGAR

## CLASS TEST & PRACTICE

## ANSWER KEY

CLASS XIIPHYSICS

TOPIC : MOVING CHARGES AND MAGNETISM

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- 1 If the beams of electrons and protons move parallel to each other in the same direction, then they  
(a) attract each other.  
(b) repel each other.  
(c) no relation.  
(d) neither attract nor repel.

1

ANS: (b) As current carried by electrons and protons are in opposite direction.

- 2 The magnetic field due to a straight current carrying conductor of infinite length at a perpendicular distance  $a$  is equal to \_\_\_\_\_.

1

$$B = \frac{\mu_0 I}{2\pi a}$$

ANS:

- 3 Relation between S.I. unit and C.G.S unit magnetic field is \_\_\_\_\_.

1

ANS:  $1 \text{ T} = 10^4 \text{ G}$

- 4 According to ampere circuital law, the line integral of the magnetic field  $\vec{B}$  around any closed path enclosing current  $I$ , is equal to \_\_\_\_\_.

1

ANS:  $\mu_0 I$

- 5 Force on a charge  $q$  moving in a magnetic field  $B$  with velocity  $v$  at angle  $\theta$  is equal to \_\_\_\_\_.

1

ANS:  $F = Bqv \sin \theta$

- 6 Force on a current carrying conductor in a magnetic field is \_\_\_\_\_.

1

ANS:  $F = BIl \sin \theta$

- 7 The magnetic field of a straight solenoid carrying current  $I$  and having  $n$  turns per unit length is \_\_\_\_\_.

1

ANS:  $B = \mu_0 nl$

- 8 A conducting circular loop of radius  $r$  carries a constant current  $i$ . It is placed in a uniform magnetic field  $B$ , such that  $B$  is perpendicular to the plane of the loop. The magnetic force acting on the loop is  
(a)  $irB$  (b)  $2\pi riB$   
(c) zero (d)  $\pi riB$

1

ANS: (c) Net force on a current carrying closed loop is always zero, if it is placed in an uniform magnetic field.

- 9 The gyro-magnetic ratio of an electron in an H-atom, according to Bohr model, is  
(a) independent of which orbit it is in.  
(b) neutral  
(c) positive  
(d) increases with the quantum number  $n$ .

$$\mu_l = \frac{-e}{2m} L, \text{ L - Angular momentum of electron}$$

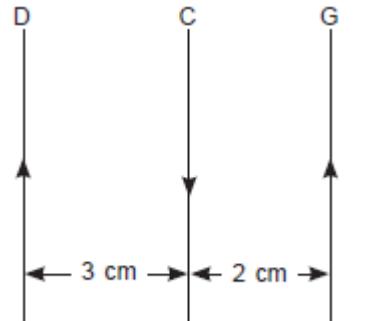
ANS: (a) The gyro-magnetic ratio is given by

- 0 An electron is projected along the axis of a circular conductor carrying the same current. Electron will experience

  - (a) a force along the axis.
  - (b) a force perpendicular to the axis.
  - (c) a force at an angle of  $4^\circ$  with axis.
  - (d) no force experienced.

ANS: (d) Since electron is moving parallel to direction of magnetic field of the conductor Force ( $F$ ) =  $qvB \sin 0 = 0$

- 11 Three long, straight parallel wires, carrying current are arranged as shown in the figure. The force



experienced by a 25 cm length of wire C is **30 A**      **10 A**      **20 A** (a)  $10^{-3}$  N (b)  $2.5 \times 10^{-3}$  N  
 (c) zero (d)  $1.5 \times 10^3$  N

ANS: (c) Force of repulsion by wire D and G on wire C is equal and opposite.

- 12 In a circular coil of radius  $r$ , the magnetic field at the centre is proportional to

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

(c) Since  $B = \frac{\mu_0 NI}{2r}$ , i.e.  $B \propto \frac{1}{r}$ ,

**ANS:**

- 13 A positive charge enters in a magnetic field and travels parallel to but opposite the field. If it experiences

  - (a) an upward force.
  - (b) a downward force.
  - (c) an accelerated force.

(d) no force.

ANS: (d) Since force  $F = qvB \sin 180^\circ = 0$

14 Deflection produced in a galvanometer when a unit current flows through it is known as \_\_\_\_\_. 1

ANS: current sensitivity

15 A moving coil galvanometer can be converted into voltmeter by connecting a large resistance R in \_\_\_\_\_ with it. 1

ANS: series

16 Maximum torque acts on a current carrying coil when it is suspended in magnetic field such that its plane is \_\_\_\_\_ to magnetic field. 1

ANS: parallel

17 An ammeter is \_\_\_\_\_ resistance galvanometer. 1

ANS: low