

O P JINDAL SCHOOL, SAVITRINAGAR

CLASS TEST & PRACTICE

ANSWER KEY

CLASS XIIPHYSICS

TOPIC : MOVING CHARGES AND MAGNETISM

- 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. 1
 - (c) no relation.
 - (d) neither attract nor repel.

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

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

- 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 θ 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: $B = \mu_0 nI$

- 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) πriB
- 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.

1

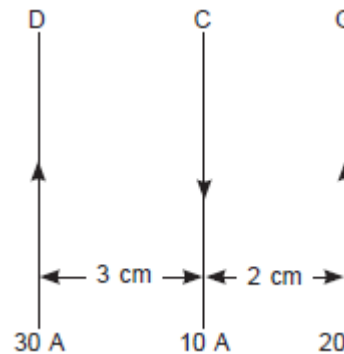
ANS: (a) The gyro-magnetic ratio is given by $\mu_l = \frac{-e}{2m}L$, L – Angular momentum of electron

- 10 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° with axis.
 (d) no force experienced.

1

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



1

experienced by a 25 cm length of wire C is (a) 10^{-3} N (b) 2.5×10^{-3} N
 (c) zero (d) 1.5×10^3 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

1

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

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

- 13 A positive charge enters in a magnetic field and travels parallel to but opposite the field. It experiences
 (a) an upward force.
 (b) a downward force.
 (c) an accelerated force.

1

(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