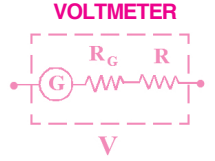


7. MOVING CHARGES & MAGNETISM



IMP DEFINITIONS & FORMULAS

1. **Oersted** found that a magnetic field is always produced around a conductor carrying current.

2. **Magnetic force** on a charged particle moving in a magnetic field is $F = Bqv \sin \theta$

3. **Magnetic force** on a conductor carrying current in a magnetic field is $F = Bi l \sin \theta$

4. **Ampere's law:** $\oint \vec{B} \cdot d\vec{l} = \mu_0 i$

5. **Biot-Savart law:** $dB = \frac{\mu_0}{4\pi} \frac{idl \sin \theta}{r^2}$

6. **Magnetic field induction** on the axis of a coil carrying current is $B_x = \frac{\mu_0 Ni R^2}{2(x^2 + R^2)^{3/2}}$

7. **Magnetic field induction** at the centre of coil:

$$B_0 = \frac{\mu_0 Ni}{2R}$$

8. **Force** between two parallel conductors carrying currents $F_{ba} = \frac{\mu_0 i_a i_b}{2\pi r} l$ (or) $f = \frac{F_{ba}}{l} = \frac{\mu_0 i_a i_b}{2\pi r}$

9. **Torque** on a coil carrying current in a magnetic field: $\tau = BiA \sin \theta$

10. **Magnetic dipole moment of a current loop:** $M = iA$

11. **Magnetic dipole moment** of revolving electron: $M = evr/2$

12. **Formula for MCG:** $\phi = \left(\frac{BAN}{C}\right)i$

13. **Formula for Shunt resistance :** $S = \frac{G}{n-1}$

BULLET MASTER'S

PHYSI BEATS!

7. MOVING CHARGES & MAGNETISM [1 VSAQ + 1 SAQ]

- Current carrying Wire చుట్టూ Magnetic Field ఏర్పడుతుందని Oersted కనుగొన్నాడు!
 - A current carrying conductor behaves like a Magnet.
- **You know: Mr. Electricity and Mr. Magnetism are two best friends.**
 - **You know:** Moving Electric charges produce magnetic field whereas Moving magnets generate Electricity.
 - **Current** ని Measure చేసే దానిని **Ammeter** అంటారని
 - **Voltage** ని Measure చేసే దానిని **Voltmeter** అంటారని మీకు తెలుసు!
 - **MCG** కి **Small resistance** ని **Parallel** గా కలిపి MCG ని **Ammeter** గా మార్చవచ్చు!
 - **MCG** కి **High Resistance** ని **Series** లో కలిపి MCG ని **Voltmeter** గా కూడా మార్చవచ్చు!

IPE View

☞ **IMP VSAQ :** Importance of Oersted's experiment, Principle of MCG,

Conversion of MCG into Ammeter, Voltmeter, Differences between Ammeter and Voltmeter

☞ **IMP SAQ :** Ampere's law, Biot Savart's law, Magnetic dipole moment of a revolving electron.