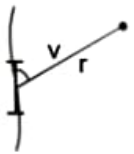
1. **Magnetic field due to a moving point charge**

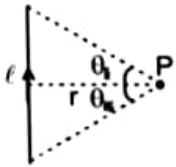
$$B = \frac{\mu_0}{4\pi} \frac{q(v \quad r)}{r^3}$$

2. **Biot-savart's Law**



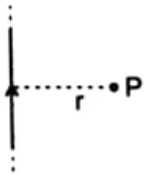
$$\overrightarrow{dB} = \frac{\mu_0 I}{4\pi} \frac{\overrightarrow{d\ell} \quad \vec{r}}{r^3}$$

3. **Magnetic field due to a straight wire**



$$B = \frac{\mu_0}{4\pi} \frac{I}{r} (\sin \theta_1 + \sin \theta_2)$$

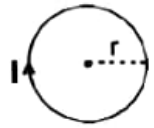
4. **Magnetic field due to infinite straight wire**



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

5. Magnetic field due to circular loop

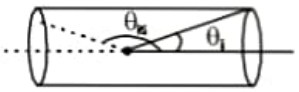
(i) At centre



$$B = \frac{\mu_0 NI}{2r}$$

(ii) At Axis $\quad B = \frac{\mu_0}{2} \frac{NIR^2}{(R^2 + x^2)^{3/2}}$

6. Magnetic field on the axis of the solenoid



$$B = \frac{\mu_0 nI}{2} (\cos\theta_1 \quad \cos\theta_2)$$

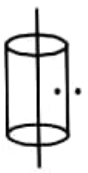
7. Ampere's Law

$$\oint B.d\ell = \mu_0 I$$

8. Magnetic field due to long cylinderical shell

$B = 0, r < R$

$= \frac{\mu_0}{2\pi} \frac{I}{r}, r \quad R$

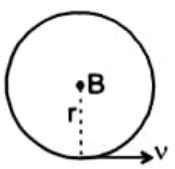


9. Magnetic force acting on a moving point charge

a. $F = q(v \quad B)$

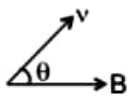
(i) $v \perp B$

$$r = \frac{mv}{qB}$$



$$T = \frac{2\pi m}{qB}$$

(ii)



$$r = \frac{mv\sin\theta}{qB}$$

$$T = \frac{2\pi m}{qB} \qquad \text{Pitch} = \frac{2\pi mv\cos\theta}{qB}$$

b. $F = q[(v \quad B) + E]$

10.	**Magnetic force acting on a current carrying wire**	$F = I(\ell \quad B)$
11.	**Magnetic Moment of a current carrying loop**	$M = N \cdot I \cdot A$
12.	**Torque acting on a loop**	$\vec{\tau} = \vec{M} \quad \vec{B}$
13.	**Magnetic field due to a single pole**	$B = \frac{\mu_0}{4\pi} \cdot \frac{m}{r^2}$
14.	**Magnetic field on the axis of magnet**	$B = \frac{\mu_0}{4\pi} \cdot \frac{2M}{r^3}$
15.	**Magnetic field on the equatorial axis of the magnet**	$B = \frac{\mu_0}{4\pi} \cdot \frac{M}{r^3}$
16.	**Magnetic field at point P due to magnet**	$B = \frac{\mu_0}{4\pi} \frac{M}{r^3} \sqrt{1+3\cos^2\theta}$