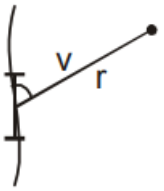
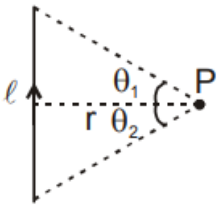
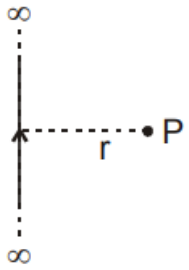
IMPORTANT JEE-NEET FORMULAS

Magnetism

Topics	Formulas
Strength of Magnetic Field	$B = \frac{\mu_0 I}{2\pi d}$ • μ_0 depicts the allowance of free space ($\mu 0 = 4\pi \times 10^{-7}$T.m/A). • I refers to the magnitude of current in amperes. • d and l refer to distance and wire's length respectively
Magnetic field due to a moving point charge	$\vec{B} = \frac{\mu_0}{4\pi} . \frac{q(\vec{v} \times \vec{r})}{r^3}$
Biot-Savart law	 $\overrightarrow{dB} = \frac{\mu_0 l}{4\pi} . \left(\frac{\overrightarrow{dl} \times \vec{r}}{r^3} \right)$
Magnetic field due to a straight wire	 $B = \frac{\mu_0}{4\pi} \frac{I}{r} (sin\theta_1 + sin\theta_2)$
Magnetic Field due to a infinite straight wire	 $B = \frac{\mu_0}{2\pi} \frac{I}{r}$

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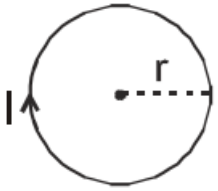
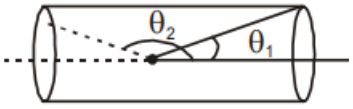
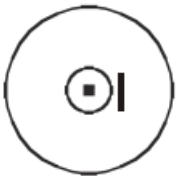
Magnetic field due to circular Loop	 At centre: $B = \frac{\mu_0 NI}{2r}$ At Axis: $B = \frac{\mu_0}{2}\left(\frac{NIR^2}{(R^2+x^2)^{\frac{3}{2}}}\right)$
Magnetic Field on the axis of the solenoid	 $B = \frac{\mu_0 n\, I}{2}(cos\ \theta_1 - \cos\theta_2)$
Ampere's Law	 $\oint \vec{B}.\vec{dl} = \mu_0 I$
Magnetic field due to long cylindrical Shell	 $B = 0, r < R$ $= \frac{\mu_0 I}{2\pi r}, r \geq R$
Magnetic force on a current carrying wire	$\vec{F} = I(\vec{l} \times \vec{B})$
Magnetic Moment of a current carrying loop	$M = N.I.A$
Torque acting on a loop	$\vec{\tau} = \vec{M} \times \vec{B}$
Magnetic field due to a single pole	$B = \frac{\mu_0 m}{4\pi r^2}$
Magnetic field on the axis of an magnet	$B = \frac{\mu_0}{4\pi}\frac{2M}{r^3}$
Magnetic field on the equatorial axis of the magnet	$B = \frac{\mu_0}{4\pi}\frac{M}{r^3}$

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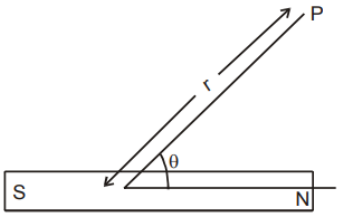
Magnetic field at point P due to magnet	 $B = \frac{\mu_o}{4\pi}\frac{M}{r^3}\sqrt{1+3\cos^2\theta}$

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