1. A straight wire carrying a 5.0 A current is in a uniform magnetic field of 0.3 T. The wire is 1.0 m long and moves at a speed of 2.0 m/s perpendicular to the magnetic field. What is the force on the wire?

\[ F = BIL \sin \theta \]

2. A wire with a cross-sectional area of 5.0 m² and a length of 1.0 m is pulled through a magnetic field of 0.25 T in 1 second. How many coulombs are in the loop for an induced current of 4 A?

\[ \text{Induced current} = \frac{\Delta B \cdot A}{\Delta t} \]

3. A charged particle moves in a uniform magnetic field of 0.1 T. The particle's velocity is 2.0 m/s at an angle of 45° to the magnetic field. What is the force on the particle?

\[ F = qvB \sin \theta \]

4. A stream of doubly charged ions moving at a velocity of 1.0 x 10^6 m/s is deflected by a magnetic field of 0.5 T. The ions are deflected through an angle of 90°. What is the radius of the circular path?

\[ r = \frac{mv}{qB} \]

5. A generator develops a maximum potential difference of 150 V. The maximum current is 10 A. What is the effective potential difference?

\[ V_{\text{eff}} = \sqrt{V_{\text{max}}^2 - I_{\text{max}}^2} \]

6. A wire loop with a cross-sectional area of 5.0 m² is pulled through a magnetic field of 0.25 T in 1 second. How many coulombs are in the loop for an induced current of 4 A?

\[ \text{Induced current} = \frac{\Delta B \cdot A}{\Delta t} \]

7. A generator develops a maximum potential difference of 150 V. The maximum current is 10 A. What is the effective potential difference?

\[ V_{\text{eff}} = \sqrt{V_{\text{max}}^2 - I_{\text{max}}^2} \]

8. A charged particle moves in a uniform magnetic field of 0.1 T. The particle's velocity is 2.0 m/s at an angle of 45° to the magnetic field. What is the force on the particle?

\[ F = qvB \sin \theta \]

9. A straight wire carrying a 5.0 A current is in a uniform magnetic field of 0.3 T. The wire is 1.0 m long and moves at a speed of 2.0 m/s perpendicular to the magnetic field. What is the force on the wire?

\[ F = BIL \sin \theta \]

10. A charged particle moves in a uniform magnetic field of 0.1 T. The particle's velocity is 2.0 m/s at an angle of 45° to the magnetic field. What is the force on the particle?

\[ F = qvB \sin \theta \]