

Alternating Current Key Terms



Here are 30 key terms and definitions related to "Alternating Current" as covered in Class 12 Physics NCERT:

1. **Alternating Current (AC):** A current that reverses its direction periodically.
2. **Cycle:** One complete set of positive and negative values of AC.
3. **Frequency (f):** The number of cycles per second, measured in hertz (Hz).
4. **Period (T):** The time taken to complete one cycle, $T = \frac{1}{f}$.
5. **Amplitude:** The maximum value of current or voltage in an AC cycle.
6. **Root Mean Square (RMS) Value:** The effective value of AC, $I_{\text{rms}} = \frac{I_0}{\sqrt{2}}$, where I_0 is the peak current.
7. **Peak Value:** The maximum value of the AC signal (current or voltage).
8. **Instantaneous Value:** The value of AC at any specific instant of time.
9. **Phase Difference:** The difference in phase between two alternating quantities.
10. **Angular Frequency:** The angular velocity of the alternating current waveform, $\omega = 2\pi f$.
11. **Capacitive Reactance (X_c):** The opposition to AC by a capacitor, $X_c = \frac{1}{\omega C}$.
12. **Inductive Reactance (X_L):** The opposition to AC by an inductor, $X_L = \omega L$.
13. **Impedance (Z):** The total opposition to AC in a circuit containing resistors, inductors, and capacitors, $Z = \sqrt{R^2 + (X_L - X_C)^2}$.
14. **Resonance:** The condition when the inductive reactance equals the capacitive reactance, making the impedance minimum.
15. **Power Factor (pf):** The cosine of the phase angle θ , $pf = \cos \theta$.
16. **AC Generator:** A device that converts mechanical energy into electrical energy using alternating current.
17. **Transformer:** A device that changes the voltage of an AC supply using electromagnetic induction.
18. **Step-up Transformer:** Increases the voltage from primary to secondary coil.
19. **Step-down Transformer:** Decreases the voltage from primary to secondary coil.
20. **Resonant Frequency:** The frequency at which resonance occurs, $f_r = \frac{1}{2\pi\sqrt{LC}}$.
21. **Power Dissipation in AC:** Given by $P = V_{\text{rms}} I_{\text{rms}} \cos \theta$.
22. **Average Power:** The time-averaged value of power in an AC circuit, $P_{\text{avg}} = \frac{P_0}{2}$.
23. **LCR Circuit:** A circuit consisting of an inductor (L), capacitor (C), and resistor (R).
24. **Series LCR Circuit:** The components are connected in series, affecting the total impedance.
25. **Parallel LCR Circuit:** The components are connected in parallel, affecting current distribution.
26. **Oscillating Current:** A current that fluctuates back and forth within a circuit.
27. **Alternator:** A device that generates alternating current by rotating a magnetic field.
28. **Choke Coil:** An inductor used to block higher-frequency AC in circuits.
29. **Q-factor (Quality Factor):** A measure of the sharpness of resonance in a circuit, $Q = \frac{\text{Resonant Frequency}}{\text{Bandwidth}}$.
30. **Harmonics:** Higher-frequency components in a non-sinusoidal AC waveform.

These are core terms and definitions that provide a foundational understanding of the concept of alternating current as per the Class 12 Physics syllabus.