

10. ALTERNATING CURRENT(AC)

IMP DEFINITIONS & FORMULAS

1. **Alternating current** $i = i_m \sin \omega t$

2. **Alternating voltage** $v = v_m \sin \omega t$

3. **Root mean square current** $i = \frac{i_m}{\sqrt{2}}$

4. **Root mean square voltage** $v = \frac{v_m}{\sqrt{2}}$

5. In a **pure inductive circuit**,

- current is $i = i_m \sin\left(\omega t - \frac{\pi}{2}\right)$
- amplitude of current $i_m = \frac{v_m}{X_L}$
- inductive reactance $X_L = \omega L$
- current lags behind the voltage by $\pi/2$

6. In a **pure capacitive circuit**,

- current $i = i_m \sin\left(\omega t + \frac{\pi}{2}\right)$
- amplitude of current $i_m = \frac{v_m}{X_C}$
- inductive reactance $X_C = \frac{1}{\omega C}$
- current leads ahead the voltage by $\pi/2$

7. **Transformer** is based on the principle of **mutual induction**.

8. **Transformer ratio:** It is the ratio between turns in secondary and turns in primary .

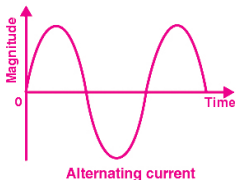
$$\bullet \text{ Transformer ratio} = \frac{N_s}{N_p} = \frac{V_s}{V_p} = \frac{i_p}{i_s}$$

9. For **Step-up** transformer $\frac{N_s}{N_p} > 1$,

10. For **step-down** transformer $\frac{N_s}{N_p} < 1$

BULLET MASTER'S

PHYSI BEATS!



10) ALTERNATING CURRENT[AC] [1 VSAQ]

AC అంటే Cool Cool AC కాదు....

AC అంటే Alternating Current

TWO TYPES OF CURRENTS (AC & DC)

AC: In AC, the current changes its direction periodically.

DC: In DC the current flows in one direction steadily.

AC Vs DC

- 1) AC is **less expensive** and easy to generate than DC.
- 2) AC can be transferred to **long distances** but DC can't.
- 3) AC has **less power loss in transmission** than DC.
- 4) **Electric shock** is more dangerous in AC than DC.

5) AC is used in regular household electrical appliances like Bulbs, Fans, heaters whereas DC is used in digital electronic devices like Computers, Laptops, Digital TVs, Mobile Phones ..

☞ AC enters into Computers, Laptops, Cellphones but inside it is converted into DC.

గుర్తుంచుకోండి: మన ఇంట్లోకి **Alternating Current** వస్తుందంటే కారణం ఇంటి బయట ఉండే **Transformer**.

Transformer Ratio, Principle involved in a transformer, Type of transformer in bedlamp and problem on transformer ratio are all truly IMPVSAQ in this chapter.

