SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

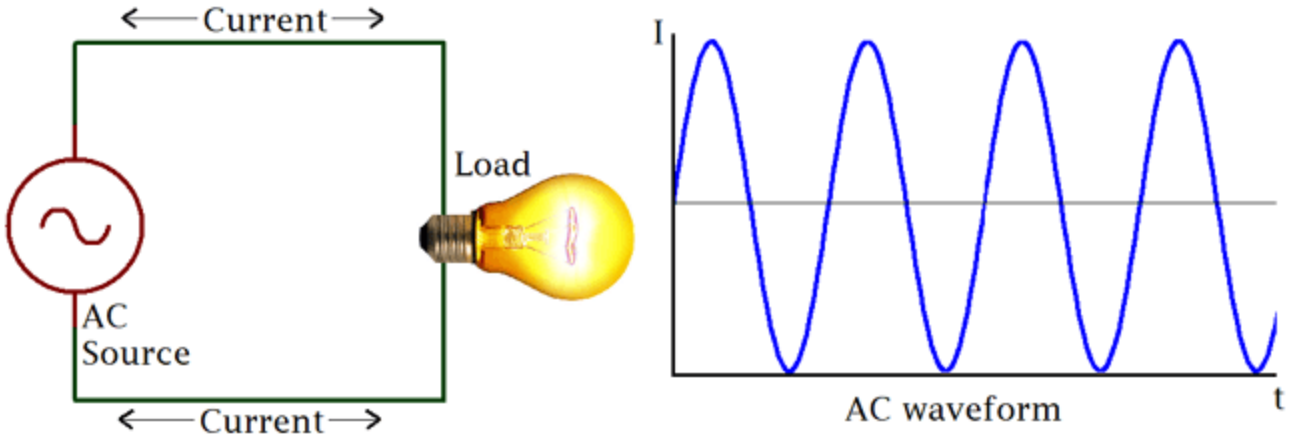
COURSE NAME : 19EE101-BASIC ELECTRICAL & ELECTRONICS ENGINEERING

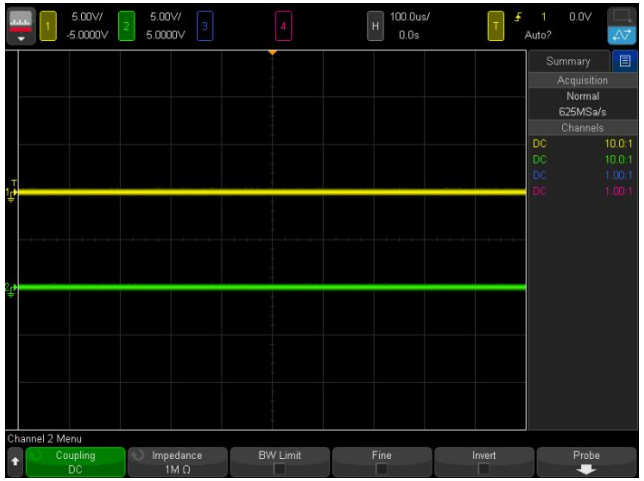
I YEAR /II SEMESTER COMPUTER SCIENCE & TECHNOLOGY

Unit 1: Electrical Circuits & Measurements

Introduction to AC Circuits

INTRODUCTION TO AC CIRCUIT

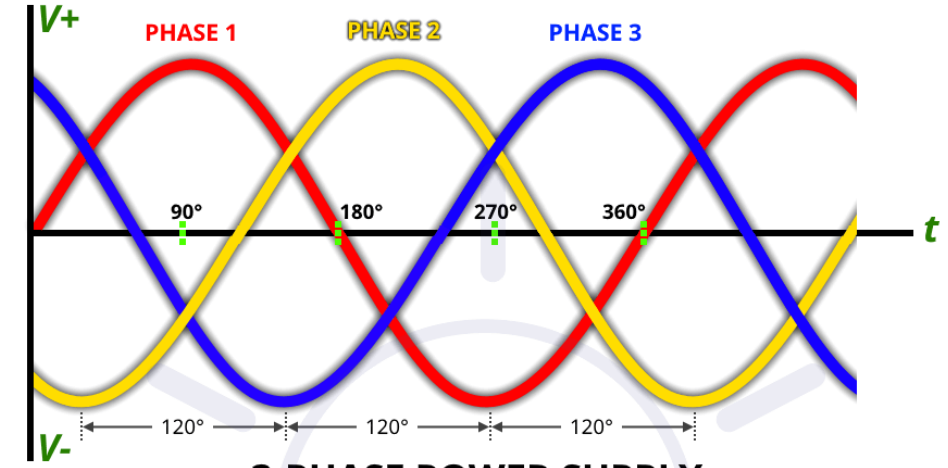




DC Waveform

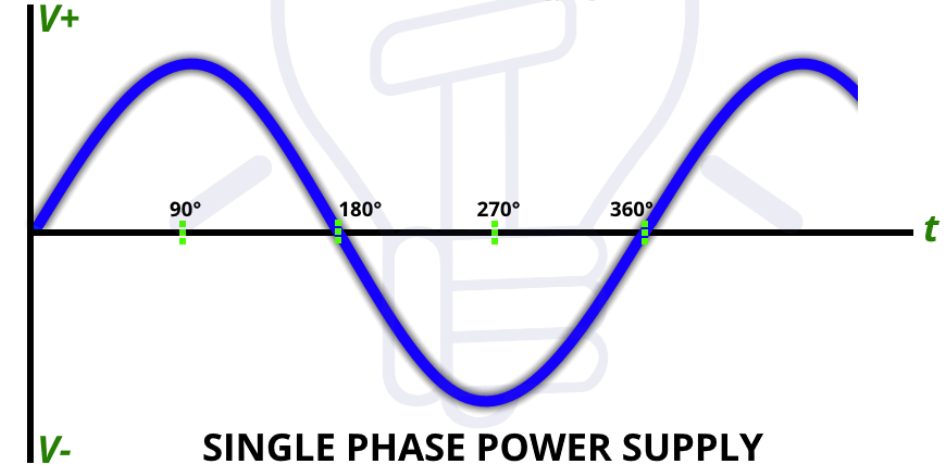
CRO-Cathode Ray Oscilloscope

3 PHASE Vs 1 PHASE SUPPLY



3-PHASE POWER SUPPLY

www.electricaltechnology.org



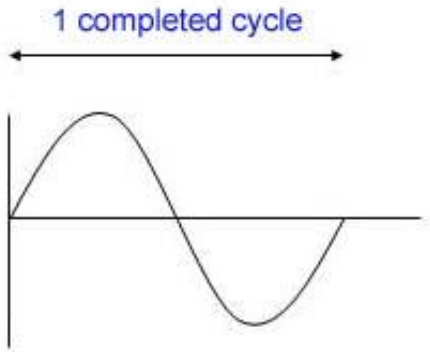
SINGLE PHASE POWER SUPPLY

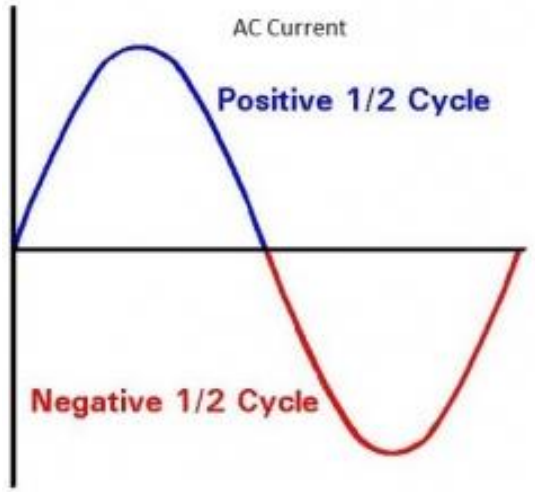
3 Phases (R,Y,B)- Each phase carry voltage & Neutral

Neutral-Return Path

1 Phase- Phase & Neutral

FREQUENCY IN AC





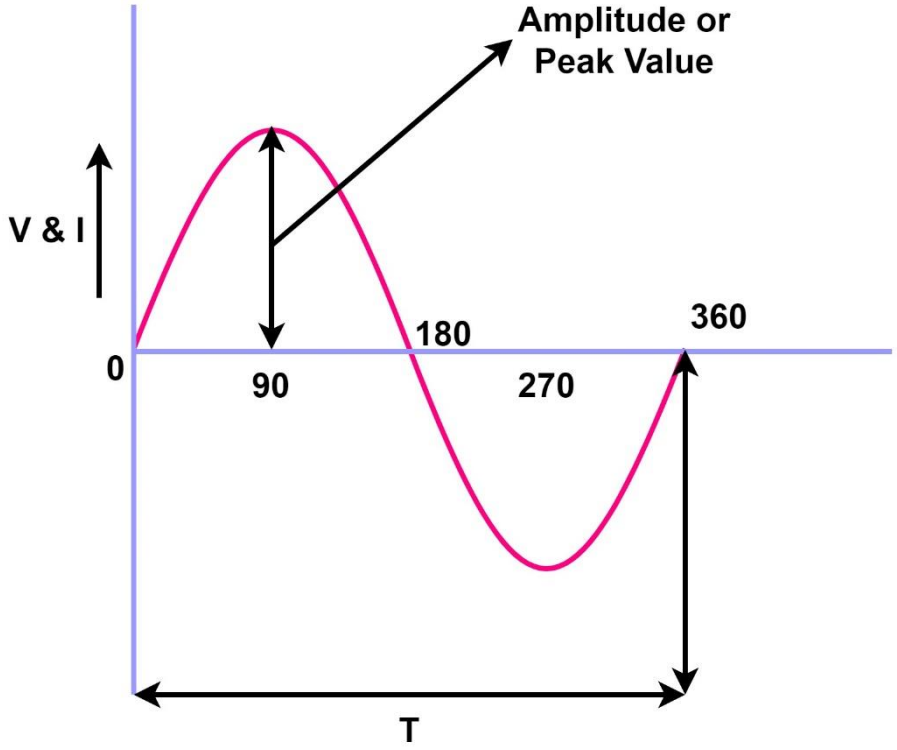
$$\text{Frequency}, (f) = \frac{1}{\text{Periodic Time}} = \frac{1}{T} \text{ Hertz}$$

or

$$\text{Periodic Time}, (T) = \frac{1}{\text{Frequency}} = \frac{1}{f} \text{ seconds}$$

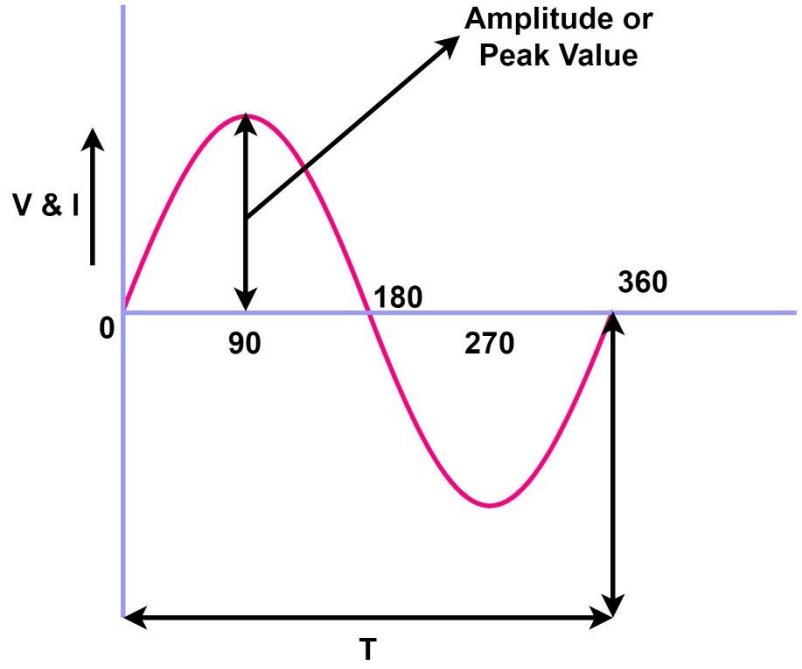
PEAK VALUE OR MAXIMUM VALUE

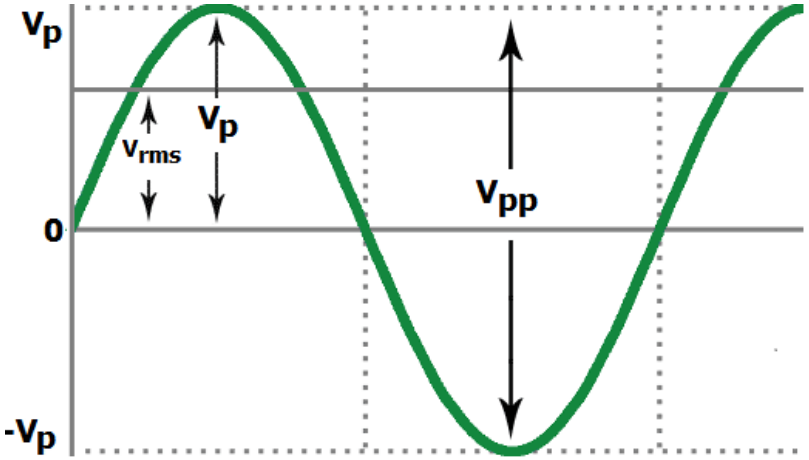
The **maximum value** attained by an alternating quantity during one cycle is called its **Peak value**. It is also known as the **maximum value** or amplitude or crest **value**.



RMS OF AC LINE

The RMS value is the effective value of a varying voltage or current.





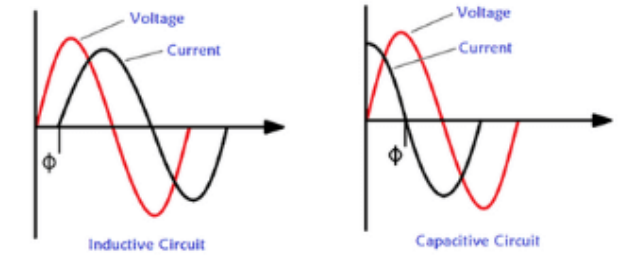
$$V_{rms} = \frac{1}{\sqrt{2}} * V_p = 0.7071 * V_p$$

$$V_{rms} = \frac{1}{2\sqrt{2}} * V_{pp} = 0.35355 * V_{pp}$$

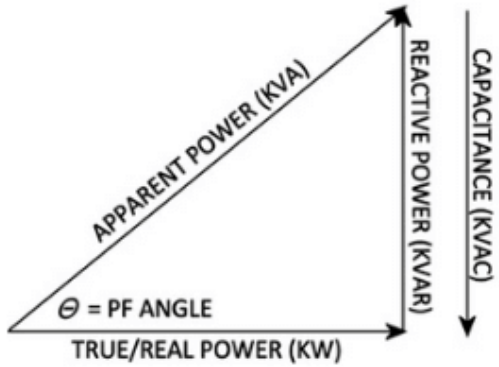
$$V_{rms} = \frac{\pi}{2\sqrt{2}} * V_{avg} = 1.1107 * V_{avg}$$

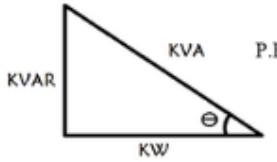
POWER FACTOR

What is Power Factor?

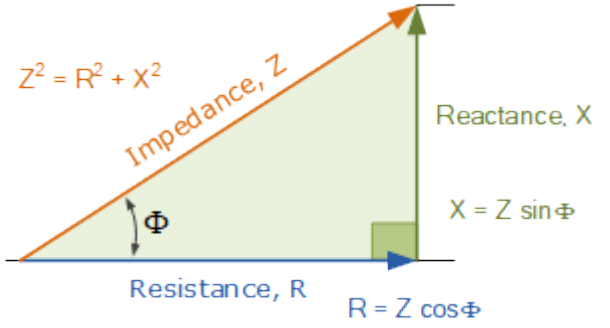


$$\text{Power Factor} = \frac{\text{Real Power}}{\text{Apparent Power}}$$





$$\text{P.F.} = \frac{\text{Actual Power}}{\text{Apparent Power}} \quad \text{or} \quad \text{P.F.} = \text{Cos}\Theta$$

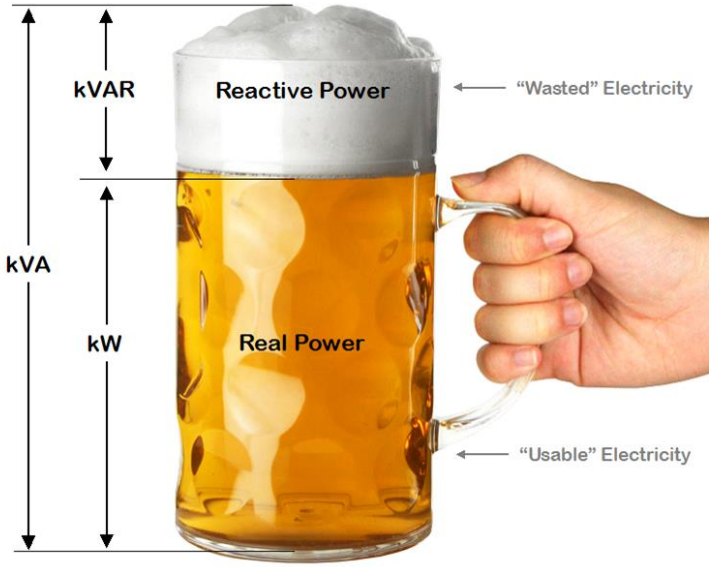


$$Z^2 = R^2 + jX^2\ (\Omega)$$

$$\cos\Phi = \frac{R}{Z}$$

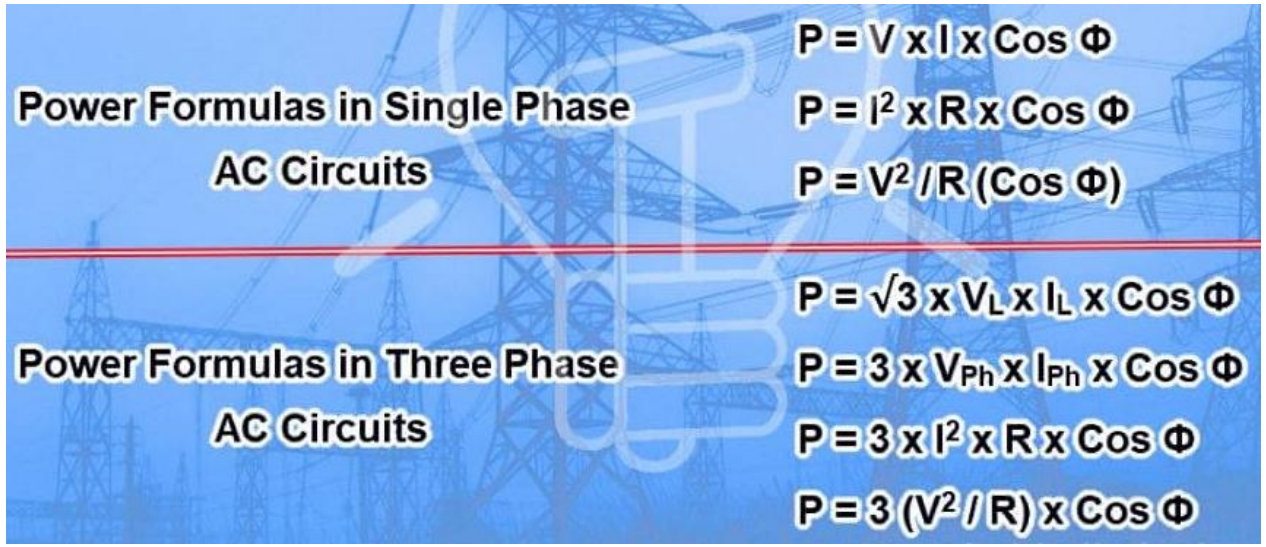
$$\sin\Phi = \frac{X}{Z}$$

$$\tan\Phi = \frac{X}{R}$$



Power factor of an AC power system is defined as the ratio of the real power absorbed by the load to the apparent power flowing in the circuit

AC POWER



Different Forms of Power Formulas in AC Circuit

REFERENCES

1. Muthusubramanian R, Salivahanan S, “Basic Electrical and Electronics Engineering”, Tata McGraw Hill Publishers, (2009) - UNIT I – V
2. Bhattacharya. S.K, “Basic Electrical and Electronics Engineering”, Pearson Education , (2017) – UNIT I – IV
3. Mehta V K, Mehta Rohit, “Principles of Electrical Engineering and Electronics”, S.Chand & Company Ltd, (2010)- UNIT I and II
4. Mehta V K, Mehta Rohit, “Principles of Electronics”, S.Chand & Company Ltd, (2005)- UNIT IV and V

THANK YOU