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

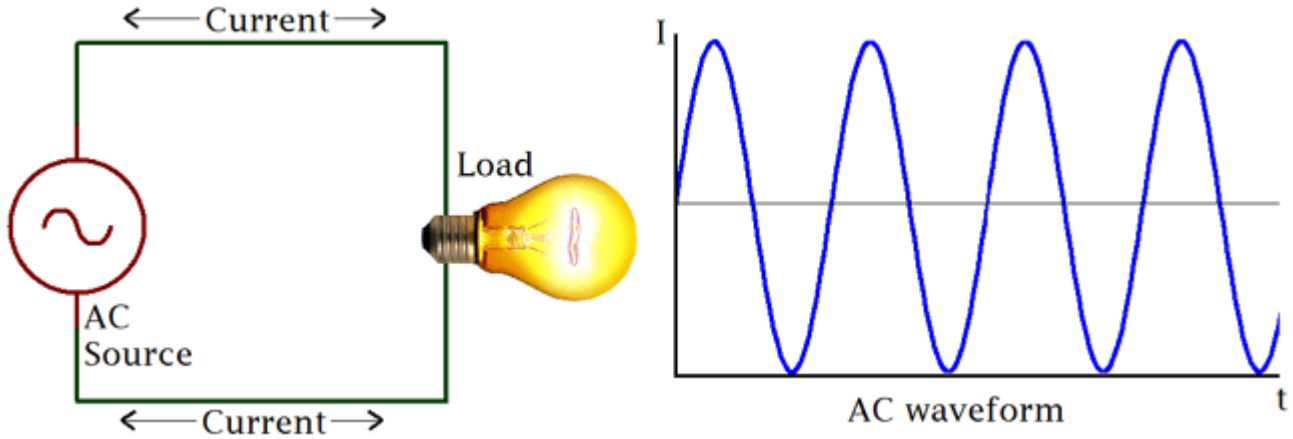
COURSE NAME : 23EET01 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

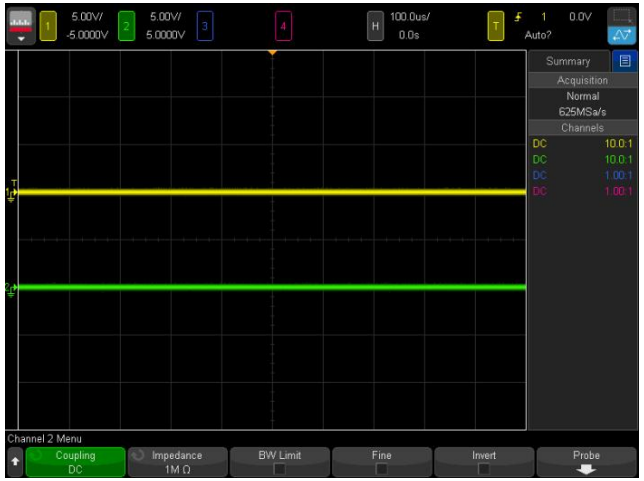
I YEAR /II SEMESTER COMPUTER SCIENCE & TECHNOLOGY

Unit 1 – Electrical Circuits and Measurements

Introduction to AC Circuits

INTRODUCTION TO AC CIRCUIT

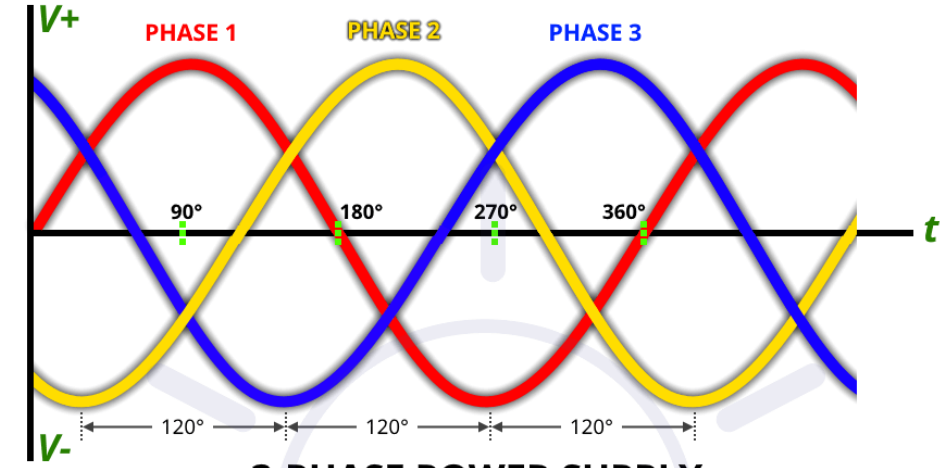




DC Waveform

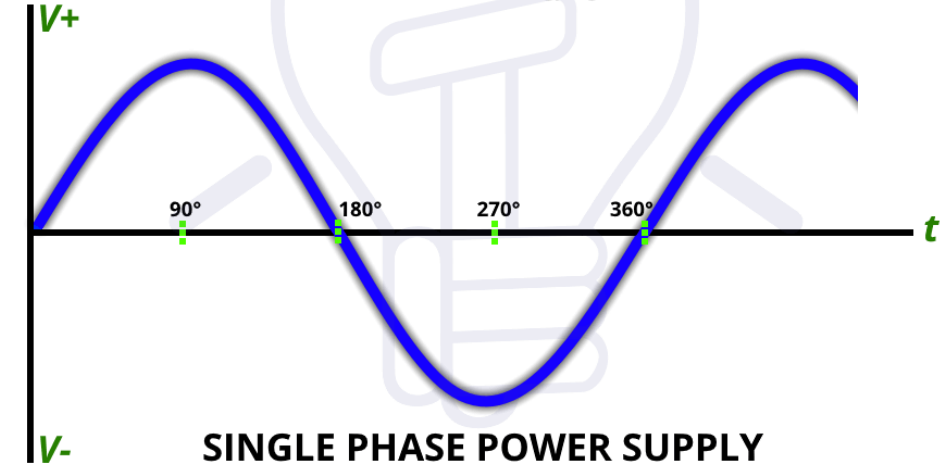
CRO-Cathode Ray Oscilloscope

3 PHASE Vs 1 PHASE SUPPLY



3-PHASE POWER SUPPLY

www.electricaltechnology.org



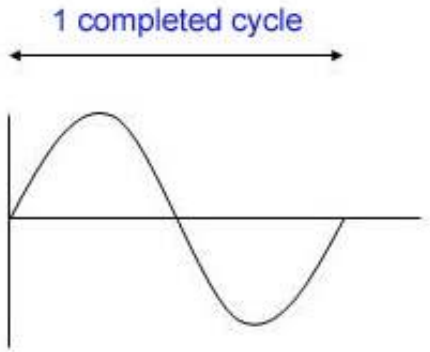
SINGLE PHASE POWER SUPPLY

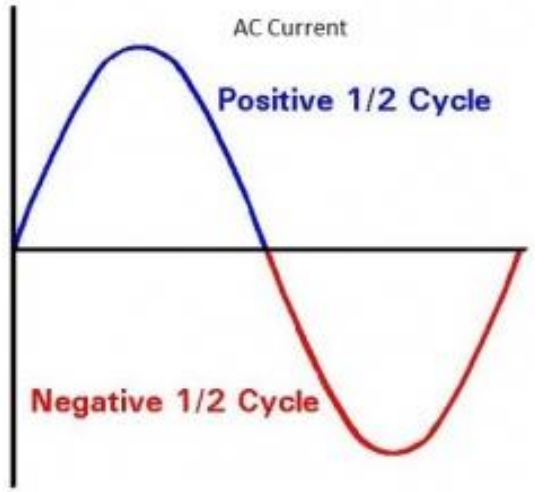
3 Phases (R,Y,B)- Each phase carry voltage & Neutral

Neutral-Return Path

1 Phase- Phase & Neutral

FREQUENCY IN AC





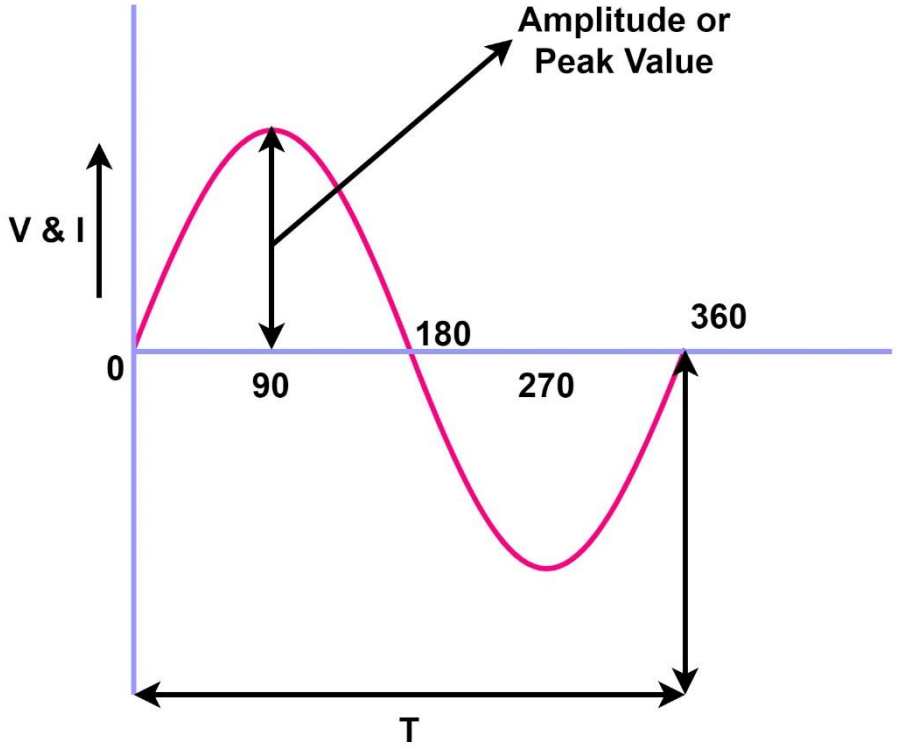
$$\text{Frequency}, (f) = \frac{1}{\text{Periodic Time}} = \frac{1}{T} \text{ Hertz}$$

or

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

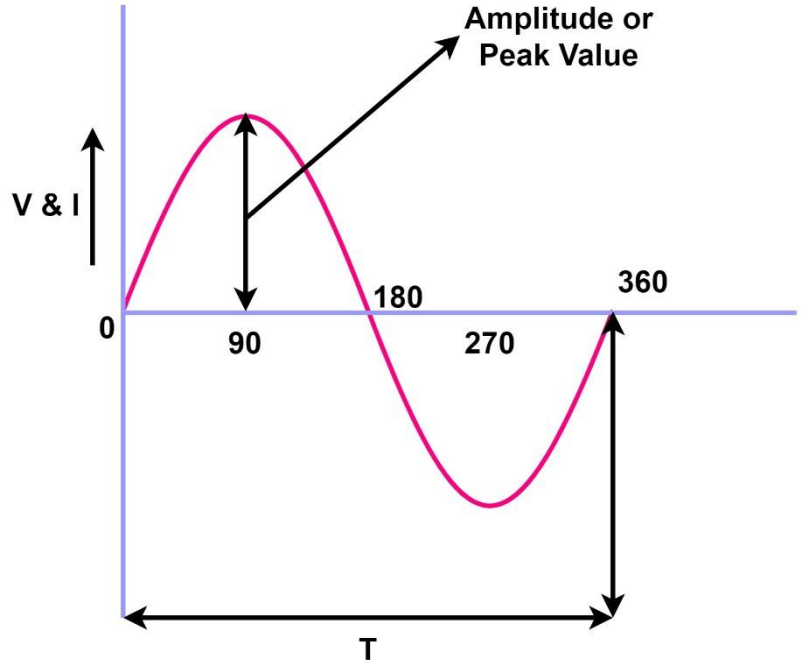
PEAK VALUE OR MAXIMUM VALUE

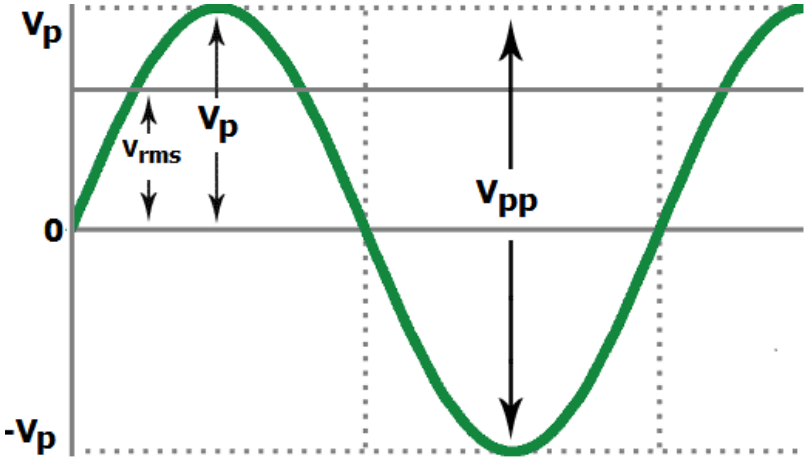
The **maximum value** attained by an alternating quantity during one cycle is called its **Peak value**. It is also known as the **maximum value** or amplitude or crest **value**.



RMS OF AC LINE

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



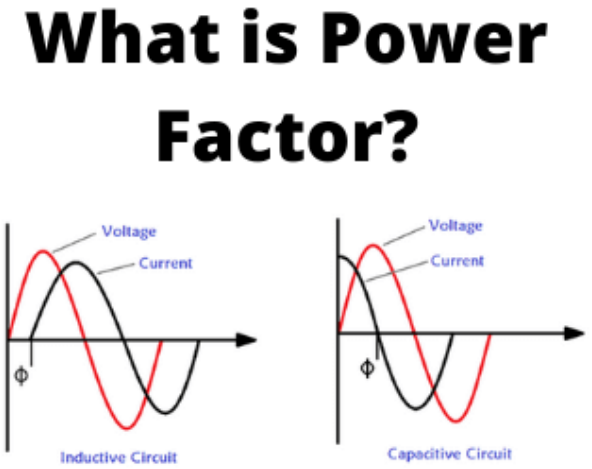


$$V_{rms} = \frac{1}{\sqrt{2}} * V_p = 0.7071 * V_p$$

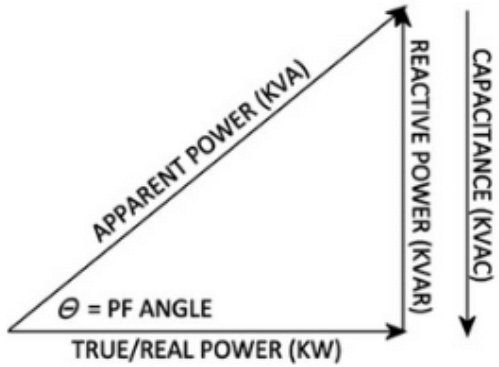
$$V_{rms} = \frac{1}{2\sqrt{2}} * V_{pp} = 0.35355 * V_{pp}$$

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

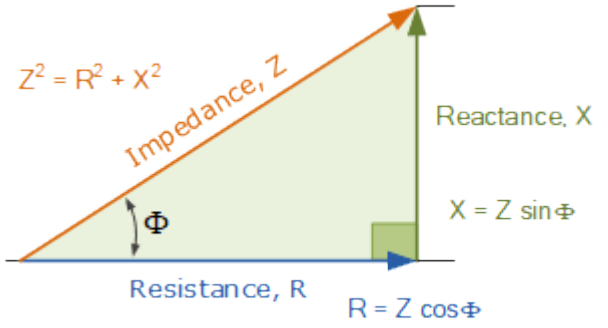
POWER FACTOR



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



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

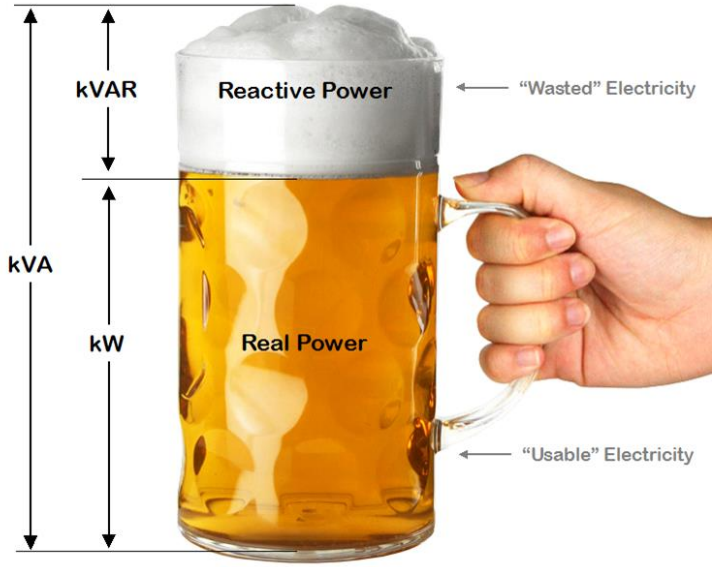


$$Z^2 = R^2 + jX^2\ (\Omega)$$

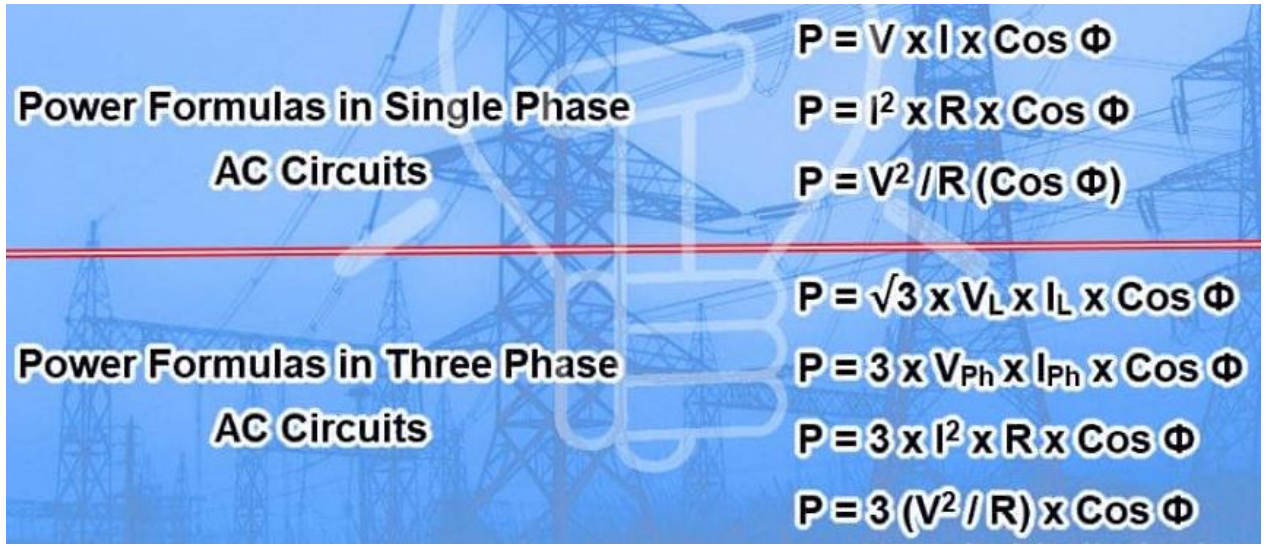
$$\cos\Phi = \frac{R}{Z}$$

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

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



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