

Unit - II

2.1 Sources, Circuit Reduction and Problems

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1

Source

Syllabus

DC \rightarrow Steady state \leftarrow AC
 \rightarrow Transient X

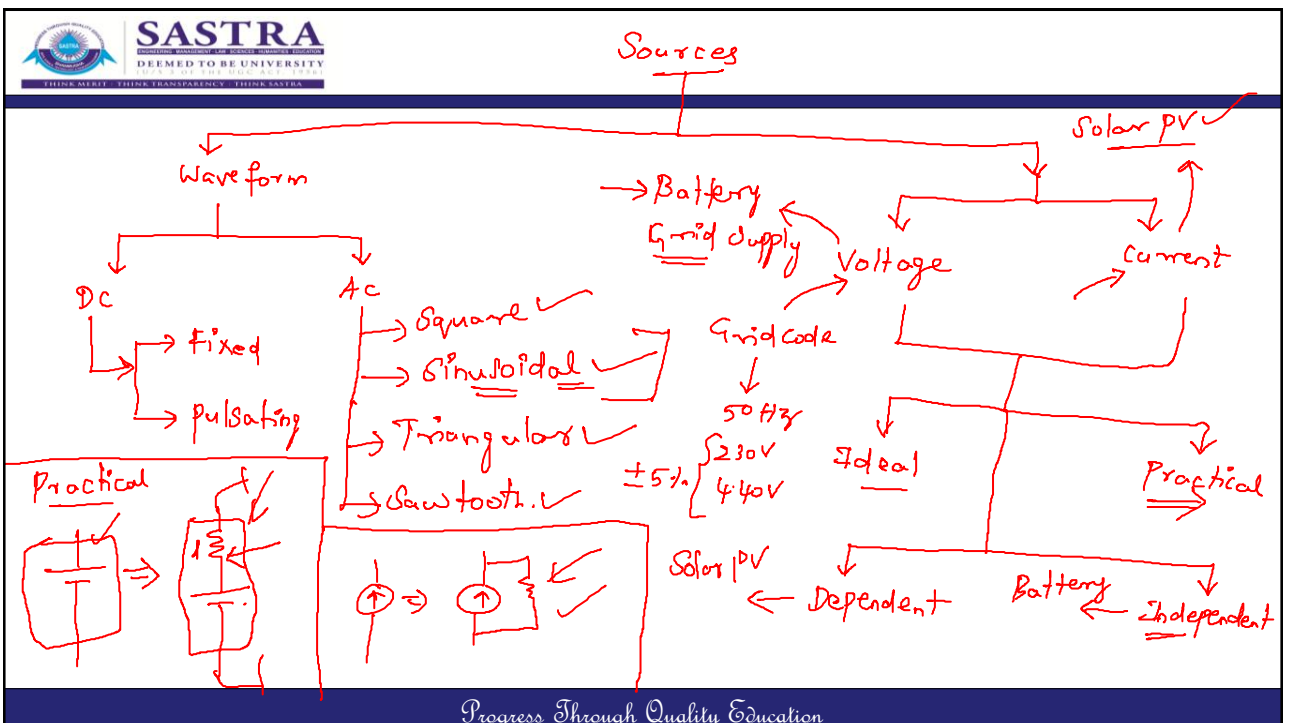
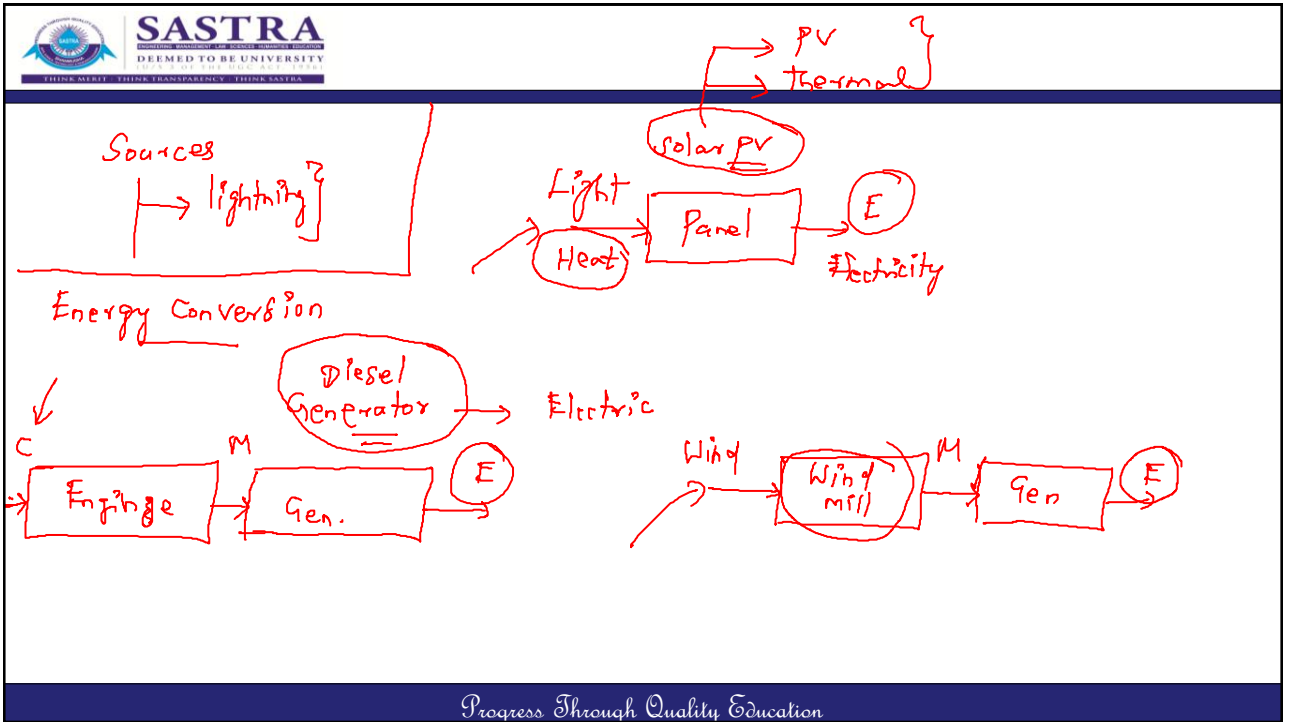
UNIT – II

14 Periods

\rightarrow **DC Circuit Analysis:** Voltage source and current sources, ideal and practical, Kirchhoff's laws and applications to network solutions using mesh analysis, - Simplifications of networks using series- parallel, Star/Delta transformation, DC circuits-Current-voltage relations of electric network by mathematical equations to analyse the network (Superposition theorem, Thevenin's theorem, Maximum Power Transfer theorem), Transient analysis of R-L, R-C and R-L-C Circuits.

\rightarrow **AC Steady-state Analysis:** AC waveform definitions - Form factor - Peak factor - study of R-L - R-C -RLC series circuit - R-L-C parallel circuit - phasor representation in polar and rectangular form - concept of impedance - admittance - active - reactive - apparent and complex power - power factor, Resonance in R-L-C circuits - 3 phase balanced AC Circuits

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Engineering Problem Solving

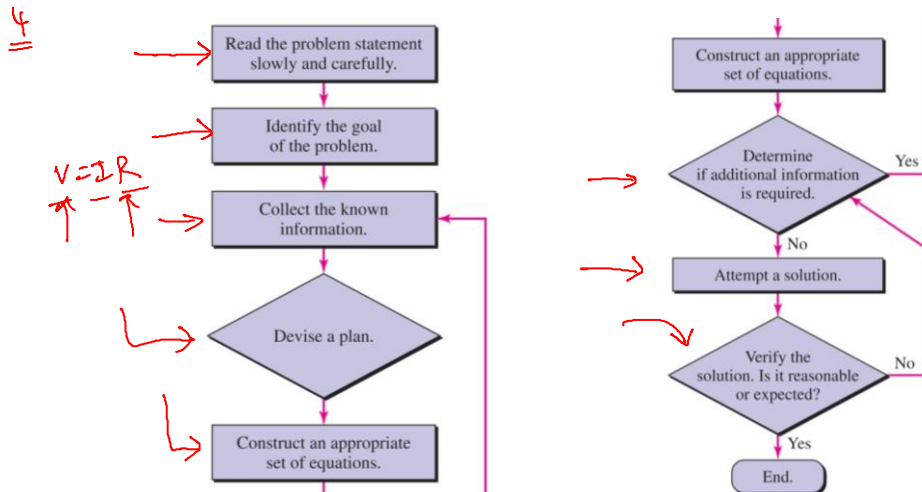
- All engineers share a considerable amount of common ground, particularly when it comes to problem solving.
- Circuit analysis has long been a traditional introduction to **the art of problem solving from an engineering perspective**.
- Analysis is the process through which we determine the scope of a problem, obtain the information required to understand it, and compute the parameters of interest. → $\frac{V}{I}$
- Design is the process by which we synthesize something new as part of the solution to a problem.
- A crucial part of design is analysis of potential solutions!

Relationship of Circuit Analysis to Engineering

In addition to preparing for further study in electrical engineering, we also will develop:

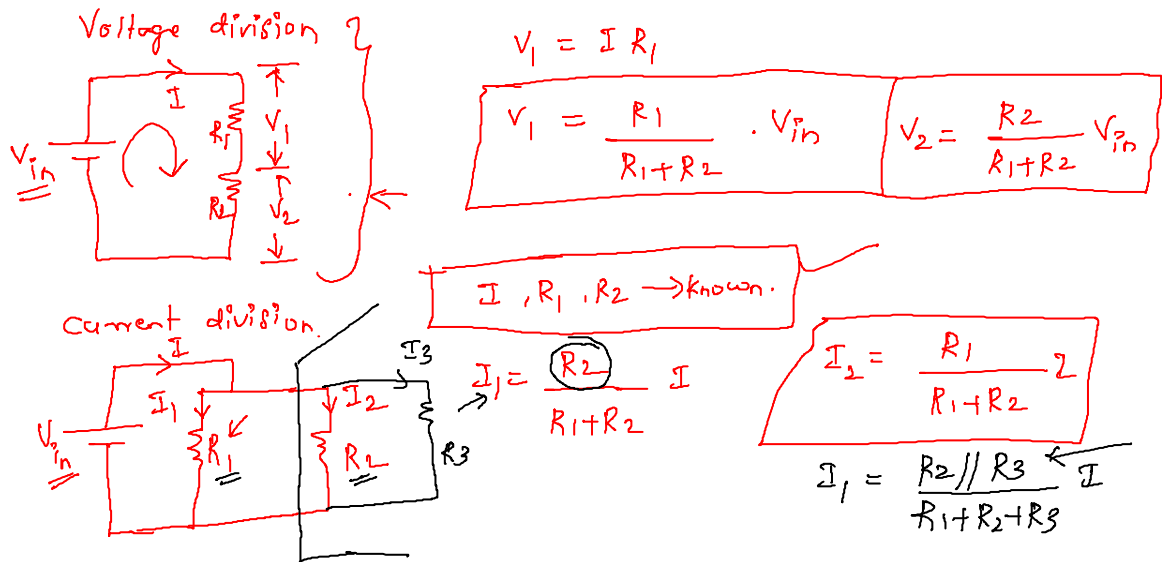
- a methodical approach to problem solving
- the ability to determine the goal or goals of a particular problem
- skill at collecting the information needed to effect a solution, and
- opportunities for practice at verifying solution accuracy.

Problem-Solving Strategies



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Division Rules

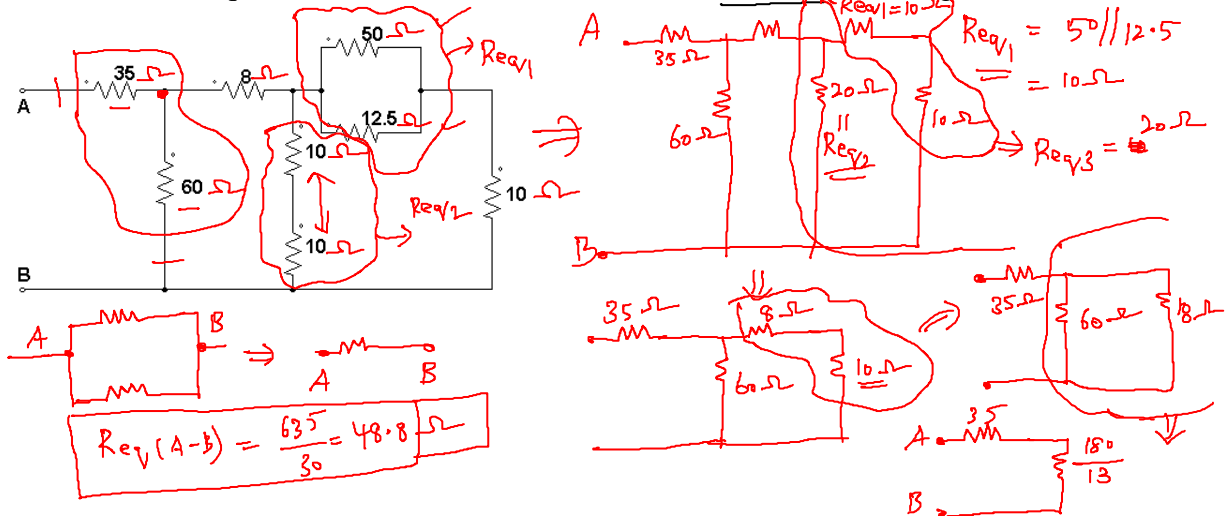


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Sample Problems

6. Determine the equivalent resistance between terminals A and B of the figure shown below.

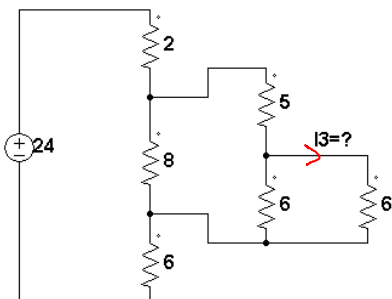


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Sample Problems

Determine the current I_3 .



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Summary

Unit - II

- Sources → V Ideal
→ I Practical
- circuit analysis
 - Engineering problem Solving
 - Division → V/I → Probl
 - Reduction → Exercise