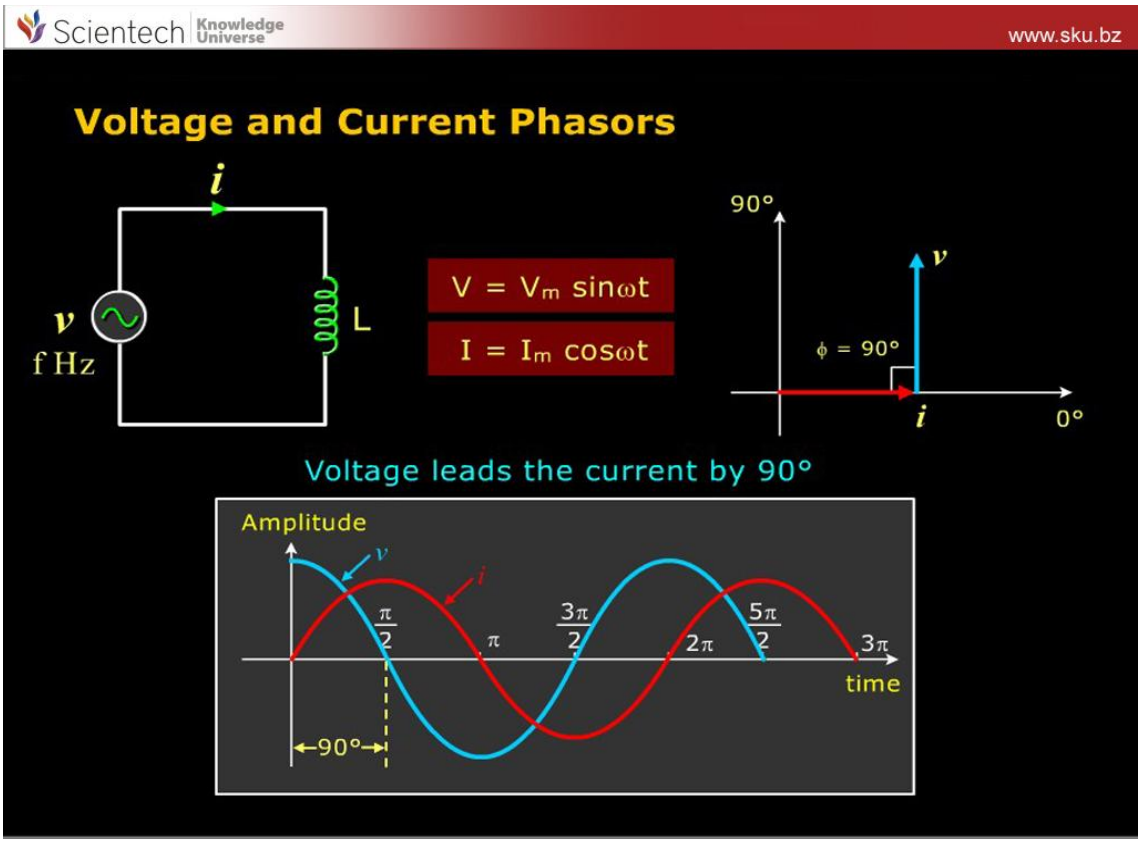
Topics Covered in SKU- Network Analysis:



Unit I:

Introduction to LLBP circuit elements R,L,C and their characteristics in terms of Linearity & time dependant nature, KCL and KVL analysis dual networks analysis of magnetically coupled circuits, Dot convention, coupling co-efficient, Tuned circuits. Series & parallel resonance voltage & current sources, controlled sources.

Unit II:

Network topology, concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices. Network Theorems – Thevenins & Norton's theorem, superposition, reciprocity, compensation, maximum power transfer and Millman's theorem, problems with controlled sources.

Unit III:

Transient analysis Transients in RL, RC & RLC Circuits initial conditions, time constants. Network driven by constant driving sources & their solutions. Steady state analysis - Concept of phasor & vector, impedance & admittance. Node & mesh analysis of RL, RC and RLC networks with sinusoidal and other driving sources.

Unit IV:

Frequency domain analysis – Laplace transform solution of intergo-differential equations. Transform of Waveform – synthesized with step, ramp, Gate and sinusoidal functions. Initial & final value theorem. Network Theorems in transform domain.

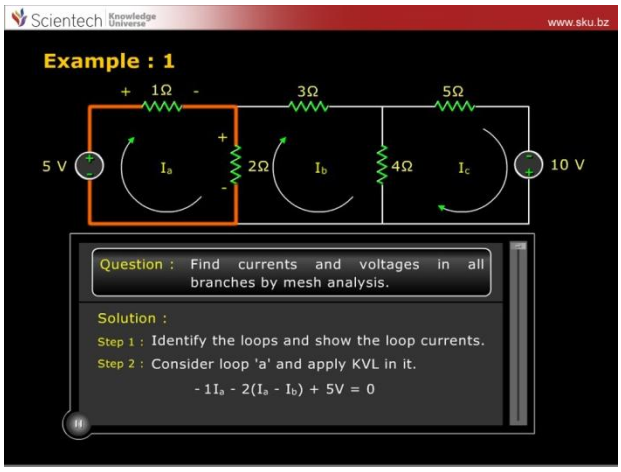
Unit V:

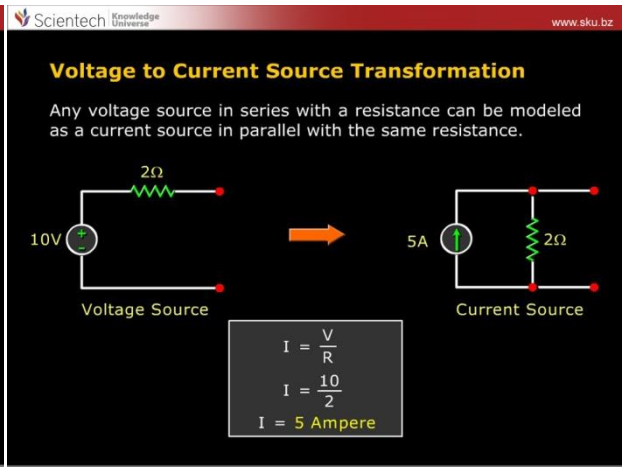
Concept of signal spectra, Fourier series co-efficient of a periodic waveform. Waveform symmetries. Trigonometric and Exponential form of Fourier series, steady state response to periodic signals.

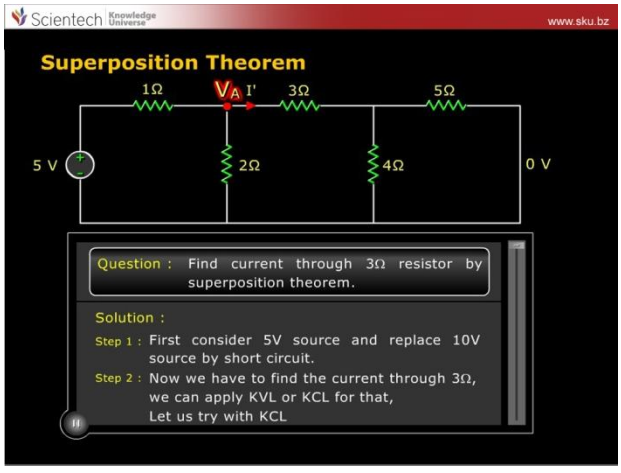
Unit VI:

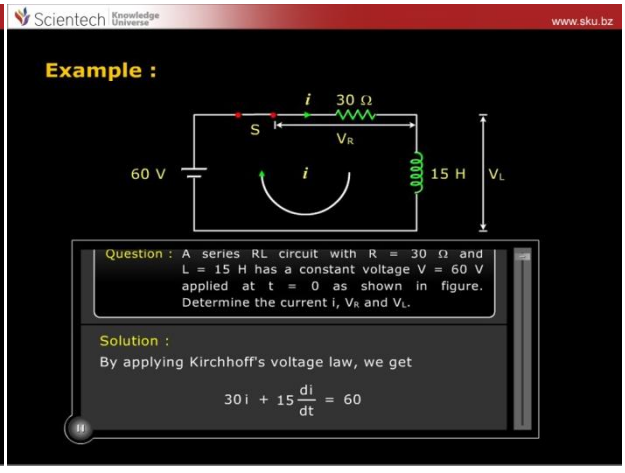
Network function & Two port networks – concept of complex frequency, port. Network functions of one port & two ports, poles and Zeros network of different kinds. Two port parameters – Z,Y, chain parameters relationship between parameters. Interconnection of two ports. Terminated two port networks.

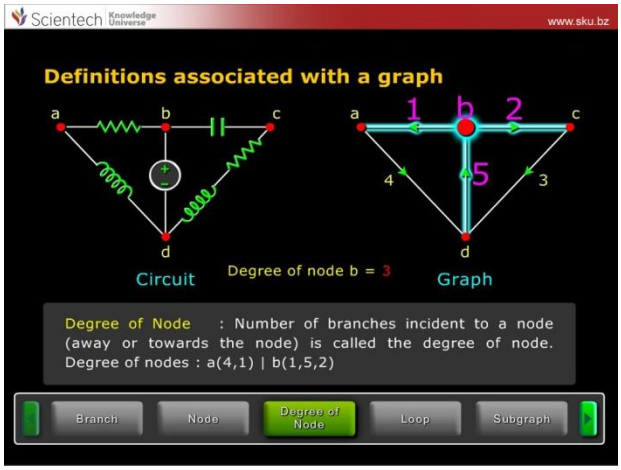
Print Shots of SKU- Network Analysis:

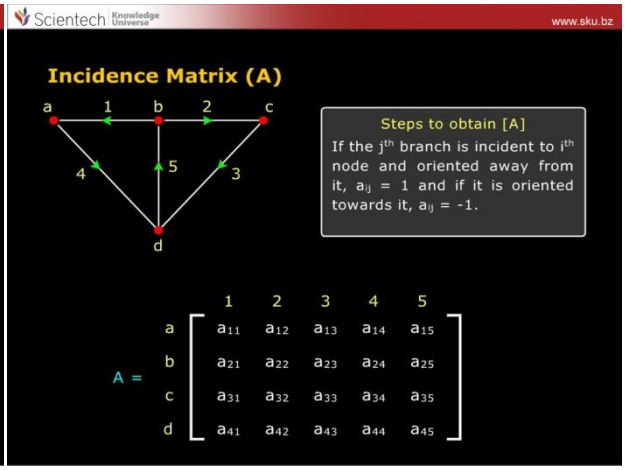


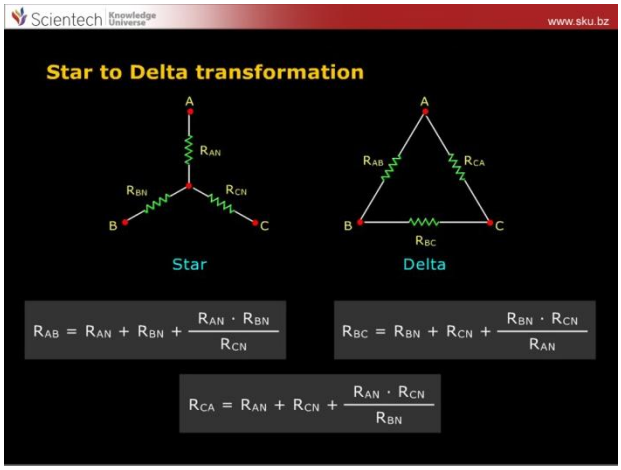


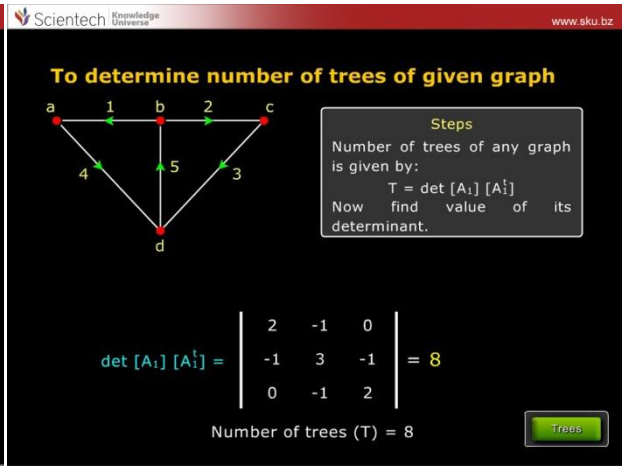





Definitions associated with a graph
a
b
c
d
Circuit
Degree of node b = 3
Graph
Degree of Node : Number of branches incident to a node (away or towards the node) is called the degree of node.
Degree of nodes : a(4,1) | b(1,5,2)
Branch
Node
Degree of Node
Loop
Subgraph


Incidence Matrix (A)
Steps to obtain [A]
If the jth branch is incident to ith node and oriented away from it, aij = 1 and if it is oriented towards it, aij = -1.
A =


Star to Delta transformation
Star
Delta
RAB = RAN + RBN + RAN · RBN / RCN
RBC = RBN + RCN + RBN · RCN / RAN
RCA = RAN + RCN + RAN · RCN / RBN


To determine number of trees of given graph
Steps
Number of trees of any graph is given by:
T = det [A1] [A1t]
Now find value of its determinant.
det [A1] [A1t] =
= 8
Number of trees (T) = 8
Trees