Adichunchanagiri University

B G S Institute of Technology

B G Nagar, Nagamangala Tq, Mandya Dist.

Department of Electronics and Communication Engineering

Network Analysis (18EC35) (Question Bank)

MODULE 1

1. Explain the fallowing terms:
   a) Active element
   b) Passive element
   c) Ideal and practical voltage sources
   d) Ideal and practical current sources and Dependent sources.
2. Derive expressions for i) Δ to Y and ii) Y to Δ transformation.
3. Explain the procedure for mesh analysis.
4. Explain the procedure for nodal analysis.
5. Explain dependent or controlled voltage and current sources.

MODULE 2

1. State and prove Millman's theorem with an example.
2. Prove that the Maximum power is transferred from source to load when
   i) $R_L = R_S$ ii) $R_L = |Z_S|$ iii) $Z_L = Z_S^*$
3. State and prove Reciprocity Theorem.
4. State and explain superposition theorem.
5. State and prove Thevenin's theorem.
6. State and prove Norton's theorem.

MODULE 3

1. What is the significance of initial conditions? Write a note on initial and final conditions for basic circuit elements.
2. State and Prove Initial and Final value theorems.
3. Obtain Laplace transform of:
   i) Step function
   ii) Ramp function
   iii) Impulse function

4. Obtain Laplace transform of:

   i) Sin^2t ii)Cos^2t iii) Sinwt iv) $\int_0^t i(t)$

MODULE 4

1. Show that the resonant frequency is equal to the geometric mean of half power frequencies. i.e., $f_O=\sqrt{f1f2}$.
2. Define quality factor and bandwidth. Also establish the relation between quality factor and bandwidth in a series circuit and thereby PT Q = fo/BW.
3. Derive an expression for resonant frequency of parallel resonant circuit containing resistances in both the branches. Also show that the circuit will resonate at all frequencies if $R_L = R_C = \sqrt{L/C}$
4. Show that the value of capacitance for max voltage across the capacitor in case of capacitor tuning series resonance is given by $C= \frac{L}{R^2+X_L^2}$
5. Define the following

   i)Resonance ii) Q-factor iii) B.W iv) Selectivity.

6. Show that the value of inductance for max voltage across the inductor in case of inductive tuning series resonance is given by $L= \frac{c}{R^2+X_c^2}$
7. Derive an expression for resonant frequency of practical parallel resonant circuit (coil and capacitor in parallel).

MODULE 5

1. Define Z parameters. Explain Z parameters in terms of Y parameters.
2. Define Y parameters. Derive Y parameters in terms of Z parameters.
3. Obtain the Transmission parameters in terms of hybrid parameters.
4. Derive h parameters in terms of Z parameters.
5. Derive h parameters in terms of Y parameters.
6. Derive h parameters in terms of T parameters.

7. Derive Y parameters in terms of h- parameters.
8. Derive Y parameters in terms of T -parameters.
9. Derive Z parameters in terms of h- parameters.
10. Derive Z parameters in terms of T- parameters.
11. Obtain the Transmission parameters in terms of Z parameters.
12. Obtain the Transmission parameters in terms of Y parameters.