R17 Regulation *Subject code:* 1P3DE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech II Year I Semester Supplementary Examinations, February 2021

Network Analysis

(Electronics and Communication Engineering)

Maximum Marks: 70 Date: 01.03.2021 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks **(10x2M=20 Marks)**

1 The resistance of two wires is 30 Ω when connected in series and 6 Ω when connected in parallel. Determine the resistance of each wire.

2 A series RC circuit has R = 5 Ω and C = 10 μF. Find time constant.

3 Define transient time.

4 How the damping ratio defines various types of damping?

5 What is excitation and response?

6 Write the expressions for root mean square and average value of a periodic waveforms.

7 What is iterative impedance?

8 Why Transfer functions are used in the analysis of the networks?

9 What is composite image filters?

10 Define Foster's reactance theorem.

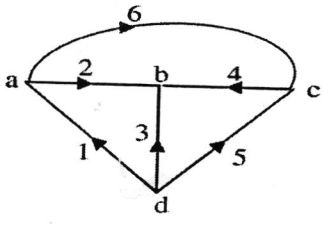
Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11 i) Define the following terms (4M)

a. Branch b.Sub Graph c.Noded.Tree

ii) For the graph given below find incidence and cut-set matrices (6M)



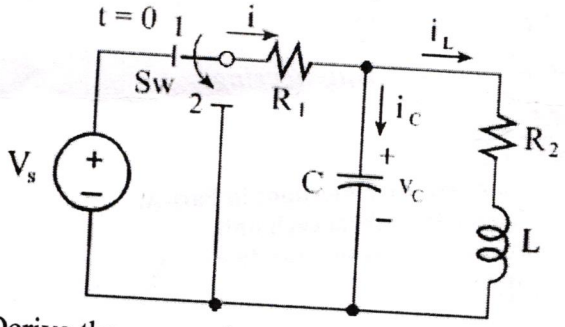
OR

12 Derive the Mutual inductance and the coupling coefficient of the transformer with necessary illustrations.

13 Derive the expression for voltage V(t) in source free RC circuit. (10M)

OR

14 In the following RLC circuit if $R_1 = 2\ \Omega$, $R_2 = 10\ \Omega$, L = 0.1H, C = 0.8mF and Vs = 120V, then find out the transient response of the inductive current after the switch is thrown from position 1 to 2 at t = 0. (10M)



15 Derive the expression for current I(t) in source free RL circuit. (10M)

OR

16 A series RLC circuit has R = 4 Ω, C = ½ F, L = 2H and connected with DC source of $v = \frac{1}{2} e^{-4t}$. Determine the voltage v_o across the impedance in the circuit. Assume zero initial conditions. (10M)

17 The Z parameters of a two-port network are $Z_{11} = 10\ \Omega$, $Z_{22} = 15\ \Omega$, $Z_{12} = Z_{21} = 5\ \Omega$. Find the equivalent T network and ABCD parameters. (10M)

OR

18 Explain about symmetry and reciprocity in Z parameters. (10M)

19 i) Design a symmetrical lattice attenuator to have characteristic impedance of 800 Ω and attenuation of 20 dB. (5M)

ii) Design a symmetrical bridged T- attenuator with an attenuation of 20 dB and terminated into a load of 500 Ω. (5M)

OR

20 Explain about LPF and HPF in detail. (10M)