



GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON – 425 002

Phone No.: 0257-2281522

Website : www.gcoej.ac.in

Fax No.: 0257-2281319

E-mail : princoej@rediffmail.com



Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **ET201U - Network Analysis and Synthesis**

Generated At : **19-04-2022 11:03:58**

Maximum Marks : **60**

Duration : **3 Hrs**

Edit **Print** **View Answer Key** **Close** **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve any two.

- a) For the network shown in Figure 1 Determine the number of all possible trees. For a tree consisting of (1, 2, 3) [6]

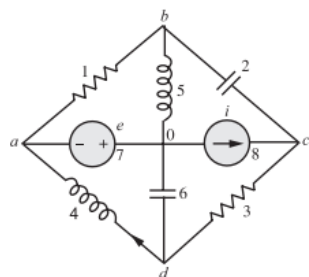


Figure 1

- b) i. Find out graph, tree, co-tree from the figure 2. [3]

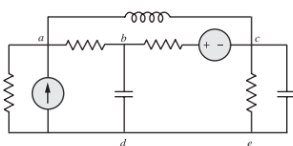


Figure 2

- ii. find out incidence matrix From the network shown in figure 3 [3]

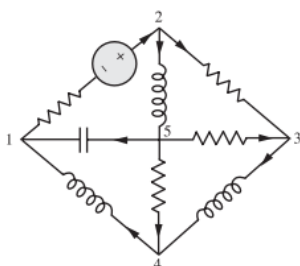


Figure 3

- c) Find out power across load using maximum power transfer theorem for ac circuit shown in figure 4. [6]

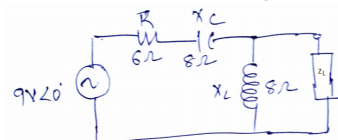


Figure 4

2) Solve any two.

- a) Obtain z parameters for the network shown in figure 5. [6]

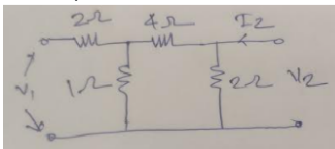


Figure 5

- b) Give relationship between y parameters and h parameters. [6]
 c) Find out the current I for $t \geq 0$ if $V_c(0) = 4V$ using transformed S-domain for the circuit shown in figure 6. [6]

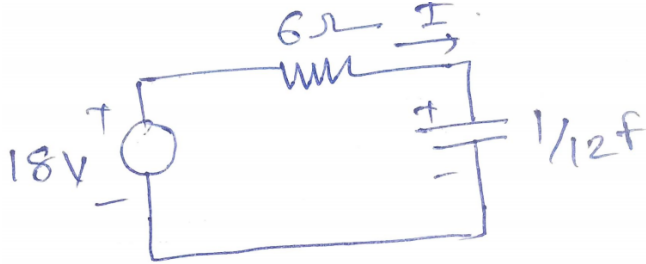


Figure 6

3) Solve any two.

- a) A 50ohm resistance is connected in series with an inductor having internal resistance a capacitor and 100V variable frequency supply shown in figure 7 at a frequency of 200Hz, Maximum current of 0.7A flows through the circuit and voltage across the capacitor is 200V. determine the circuit component. [6]

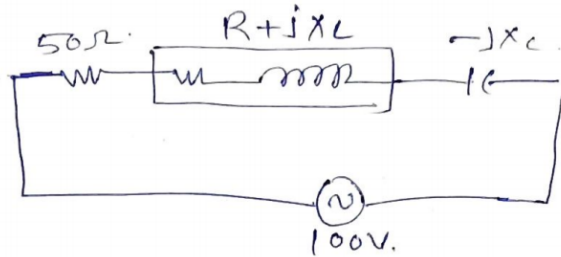


Figure 7

- b) Derive the expression for the frequency at which the voltage occurs the capacitor in series resonance circuits in terms of quality factor and resonance frequency. [6]
 c) Design a balance bridge attenuator to have characteristics impedance of 600ohm and offer an attenuation that can be varied between 0 to 20dB in steps of 5dB. [6]

4) Solve each question.

- a) Designed an m-derived low pass filter having a cut-off frequency of 1 kHz, Design impedance of 400ohm and resonant frequency 1100Hz. [6]
 b) Driving point impedance of an LC network is given by
 $Z(s) = (2s^5 + 12s^3 + 16s) / (s^4 + 4s^2 + 3)$
 Determine the first Cauer form of network. [6]

5) Solve each question.

- a) The switch in The circuit shown in figure 8 is closed at $t=0$. find $v_2(t)$ for all $t \geq 0$ by a time-domain method. Assume zero initial currents in the inductance. [6]

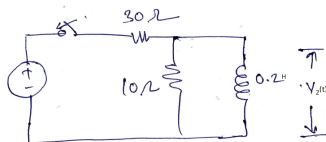


Figure 8

- b) Design a constant K, T-section band-pass filter with the cutoff frequencies of 1kHz and 4 kHz. The design impedance is 600 ohms. [6]

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