

B.Tech III Semester Regular/Supplementary Examinations, February 2021

ELECTRICAL CIRCUIT ANALYSIS
 (Electrical and Electronics Engineering)

Maximum Marks: 70

Date: 19.02.2021 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 which carries 10M.
 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)

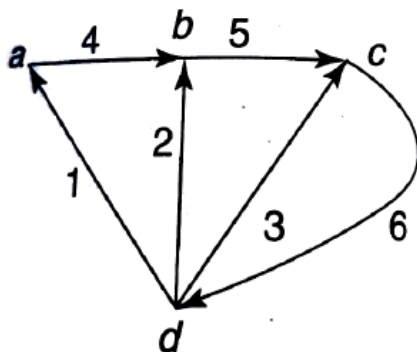
- 1 Define Graph and Tree?
- 2 What is duality?
- 3 Define Steady state response?
- 4 Write the time constants of R-L, R-C circuits?
- 5 What are zeros and poles of a network function?
- 6 Define Series resonance?
- 7 Express Z-parameters.
- 8 What are the necessity conditions for driving point functions?
- 9 What are desirable characteristics of ideal filter?
- 10 Define Low-pass and Band-pass filters?

Part-B

Answer All the following questions.

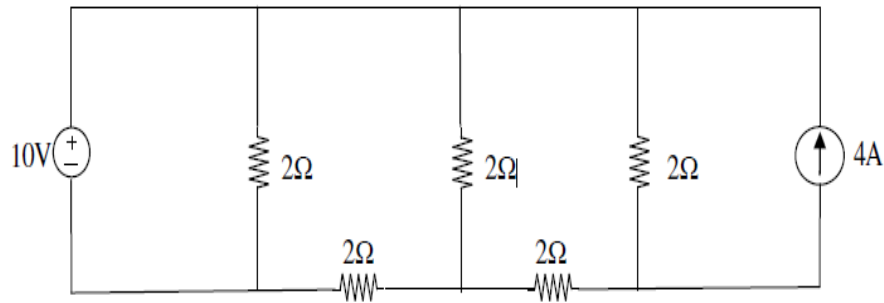
(10MX 5=50Marks)

- 11 A. For the graph shown in figure select a tree, obtain the tie-sets and cut-set matrices



(5M)

- B. For the given circuit draw the graph of the network, find tie-set schedule and from given network. (5M)



OR

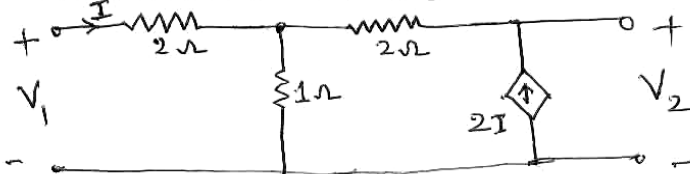
- 12 A. Explain about Dot convention. (5M)
 B. Explain Basic incidence matrix and Basic cut set matrix with example. (5M)
- 13 Derive the expression for current for a DC excited RL series circuit under transient conditions. (10M)

OR

- 14 A. Derive the expression for transient response of series R-C circuit driven by step excitation? (5M)
 B. The switch of a RLC series circuit is closed at $t=0$ where $R=20\Omega$, $L=0.05H$, $C=20\mu F$. When excited by 100V source. Find the transient current? (5M)
- 15 A. The transform of current is $I(s) = \frac{2s}{(s+1)(s+2)}$. sketch its pole-zero plot and obtain time domain response $i(t)$. (5M)
 B. Explain time domain behavior of network function from pole-zero plot with an example. (5M)

OR

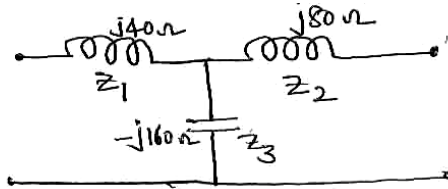
- 16 Derive the expression for Resonance and Bandwidth for RLC Series circuit. (10M)
- 17 A. Find Z- parameters of the network shown in fig. (5M)



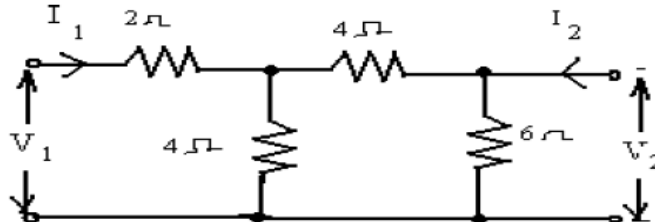
- B. The Z-parameters of a two port network are $Z_{11}=15$, $Z_{22}=24$, $Z_{12}=Z_{21}=6$. In terms of ABCD parameters (5M)

OR

- 18 A. Find Y-parameters of network shown in fig. (5M)



B. Determine the ABCD parameters of the network shown in figure. (5M)



19 Explain classifications of filters in detail. (10M)

OR

20 A. Design m-derived T and π sections low pass filters for nominal characteristic impedance $R = 600 \Omega$, cutoff frequency = 1800 Hz and infinite attenuation frequency is 2 kHz. (5M)

B. Explain design of m-derived low pass filter. (5M)