

27/6/2016

4E4172

Roll No. _____

Total No of Pages: 7

4E4172

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Electrical Engineering

4EE2A Circuit Analysis-II

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL

2. NIL

UNIT-I

Q.1 (a) Explain the Concept of Complex frequency. [6]

(b) Obtain $\frac{V(s)}{I(s)}$ and $\frac{V_{ab}(s)}{V(s)}$ for the Network shown in fig.1 [10]

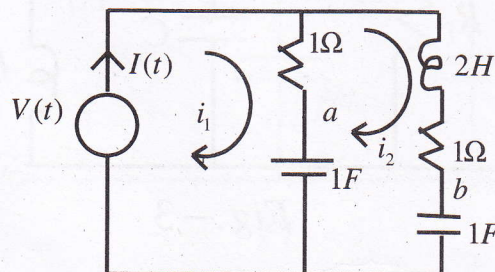


Fig. -1

OR

- Q.1 (a) Determine the condition under which the input impedance of Network shown in fig.2 will be equal to R [8]

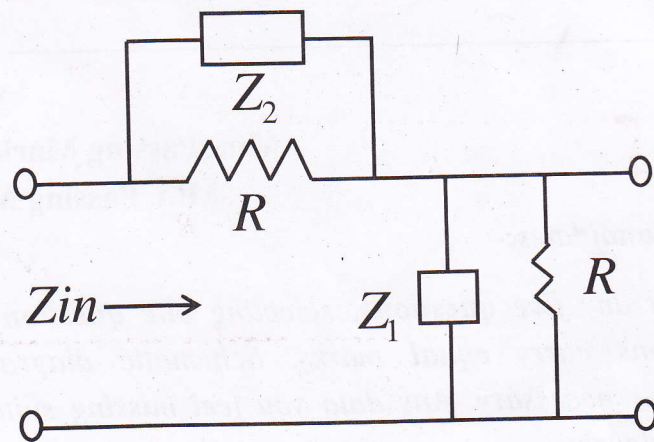


Fig.-2

- (b) Find the Transform Impedance $Z(s)$ and admittance $Y(s)$ of the one port network shown in fig.3 [8]

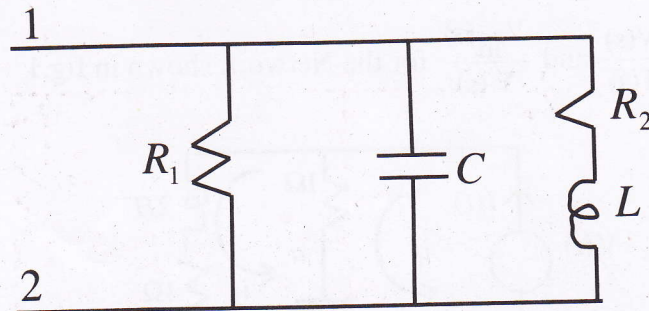


Fig.- 3

UNIT-II

Q.2 (a) Write down necessary Condition for Transfer function and also find Transfer

function $Z_{21}(s) = \frac{V_2(s)}{I_1(s)}$ of the Network given in fig.4 [8]

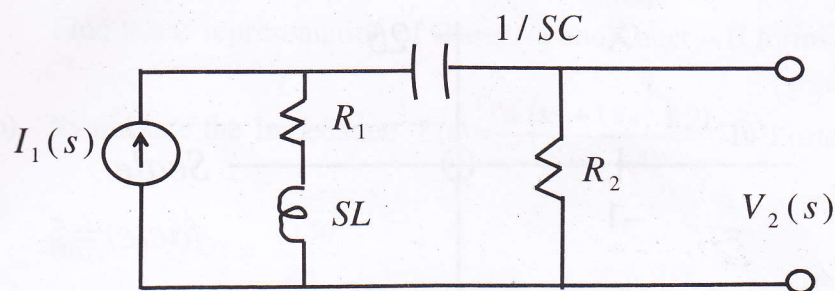


Fig . - 4

(b) For Network shown in fig.5. Compute

[8]

(i) $G_{21}(s) = \frac{V_2(s)}{V_1(s)},$

(ii) $\alpha_{21}(s) = \frac{I_2(s)}{I_1(s)}$

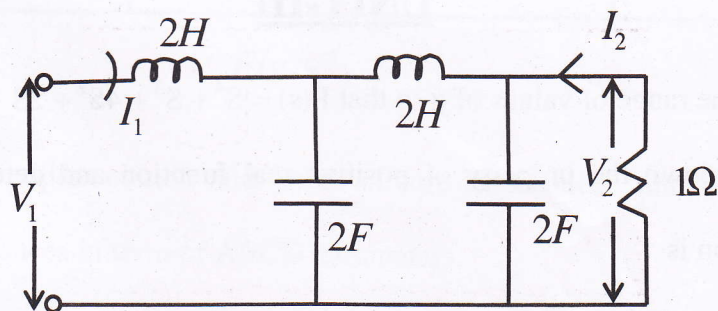


Fig-5

OR

- Q.2 (a) A series RLC circuit has for its driving point admittance pole zero diagram as shown in fig.6 find the value of R,L,C [8]

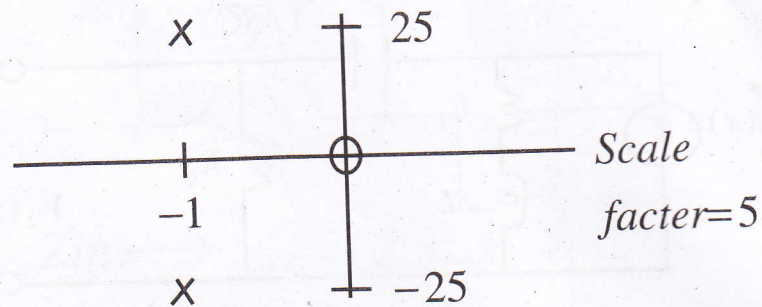


Fig.-6

- (b) If Laplace transform of a voltage $V(t)$ is

$$V(s) = \frac{4(s+1)}{(s+2)(s+3)}$$

Draw pole - zero of this function and Determine $V(t)$

[8]

UNIT-III

- Q.3 (a) Find the range of values of a so that $P(s) = s^4 + s^3 + 4s^2 + 2s + 3$ is Hurwitz. [6]

- (b) Write down the property of positive real function and determine whether the function is

$$Z(s) = \frac{2s^2 + 5}{s(s^2 + 1)} \text{ is P. r. or not}$$

[10]

OR

Q.3 (a) An Impedance function is given by

$$Z(s) = \frac{(s+1)(s+4)}{s(s+2)(s+5)}$$

Find R – C representation of Cauer – I and Cauer – II forms. [8]

(b) Synthesize the Impedance $Z(s) = \frac{K(s^2 + 1)(s^2 + 9)}{S(s^2 + 4)}$ In Foster – I and Foster – II

forms if $Z(-2) = \frac{-130}{16}$ [8]

UNIT-IV

Q.4 (a) Find Z – parameters for the Network shown in fig.7 [8]

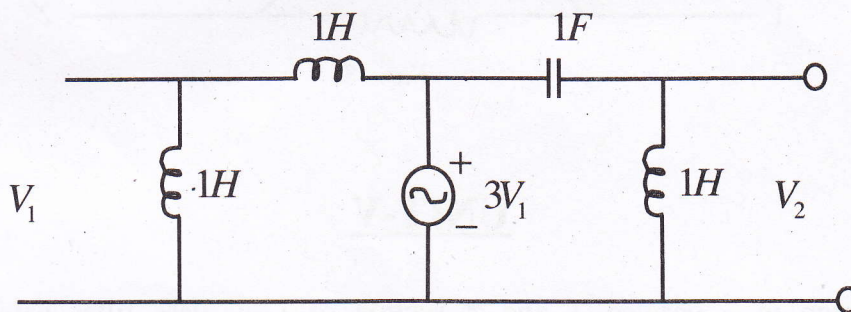


Fig-7

(b) Define open circuit and short circuit Impedances and also calculate these Impedances in term of ABCD parameters. [8]

OR

- Q.4 (a) Show that when two 2 – port Networks N_1 and N_2 are connected in parallel, the equivalent Y – parameters of the combined network is the sum of Y – parameters of each individual two – port network. [8]
- (b) For the Lattice two port network of fig.8 find the Image Impedance and Image Transfer Constant. [8]

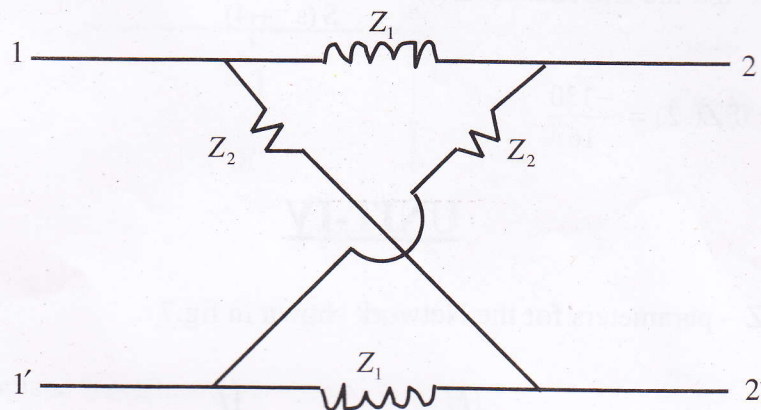


Fig.-8

UNIT-V

- Q.5 (a) Design m – derived T and π section of Low Pass filter having a design Impedance 600 ohm and cut off frequency of 2000 Hz and a frequency of infinite alternation $f_{\infty} = 2100\text{Hz}$. [8]
- (b) Write down short note on active filter. [8]

OR

Q.5 (a) Derive the value of characteristic Impedance for a T type constant K low pass filter. [8]

(b) Design a prototype section of band pass filter having cut off frequency of 1000Hz and 5000Hz and design Impedance of 600Ω . [8]
