

Sec III / INST / CBGS / May-17 / 06/06/2017

QP Code : 551002

(3 Hours)



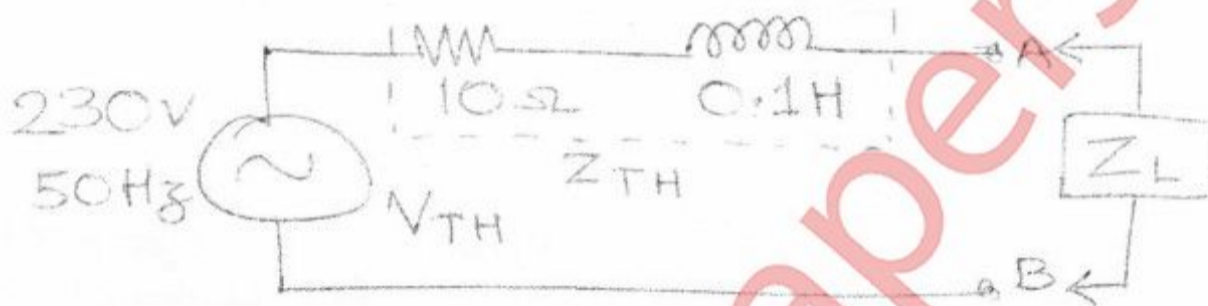
[Total Marks : 80

- N.B. :** (1) Question No. 1 is Compulsory.
 (2) Attempt **any three** questions from remaining **five** questions.
 (3) **All** questions carry **equal** marks.

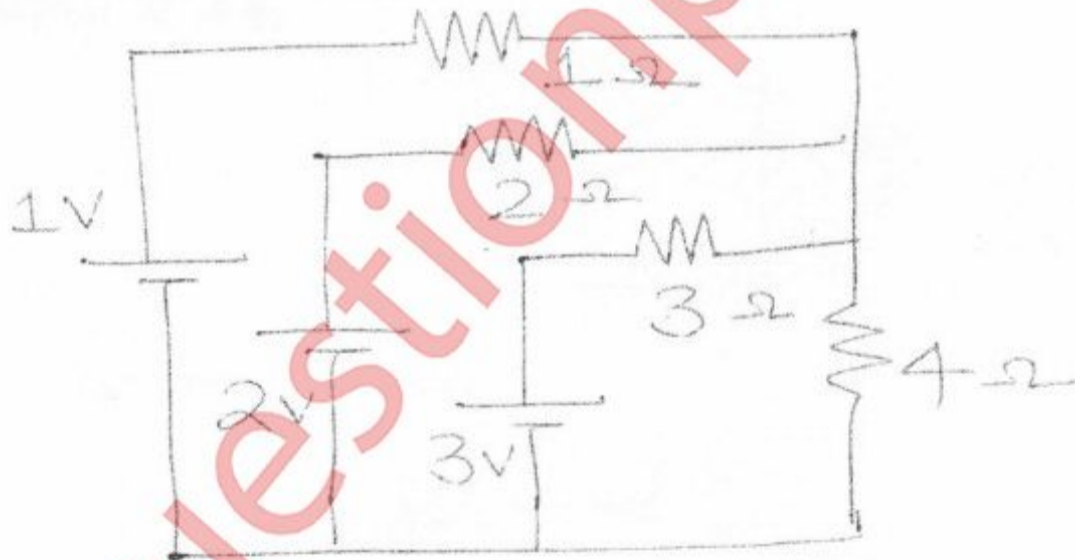
1. Attempt any **five** :

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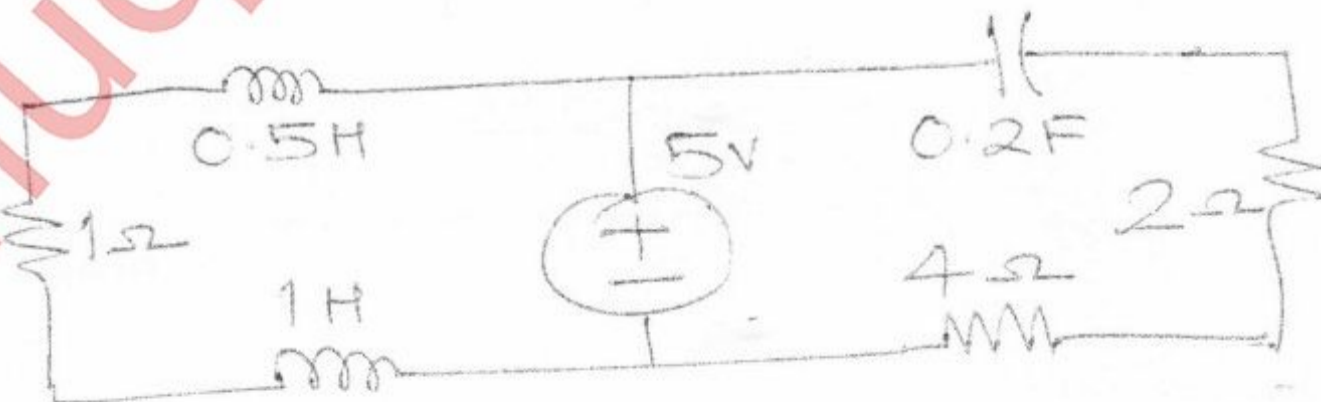
- (a) Determine value of Z_L for maximum power transfer and calculate **max.** Power.



- (b) Find $I_{4\Omega}$ using Nodal analysis.



- (c) Obtain dual of given network



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(d) If $Z_{11} = 5\Omega$, $Z_{22} = 7\Omega$, $Z_{12} = Z_{21} = 3\Omega$ for a two part network, find ABCD parameters.

(e) Find the current through a capacitor of value $1/2$ F given that voltage across capacitor is

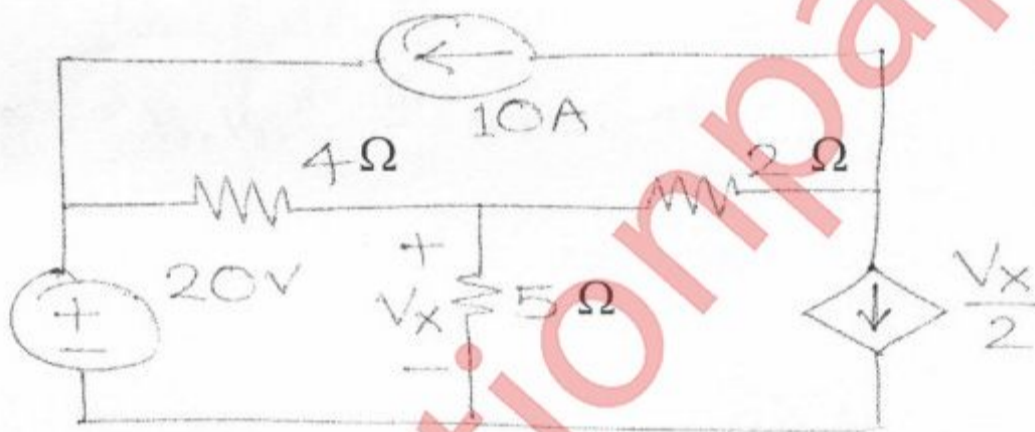
$$V_C(s) = \frac{1}{S^2 + 1}$$

(f) Test whether following polynomial is hurwitz.

$$P(S) = S^5 + 2S^3 + S$$

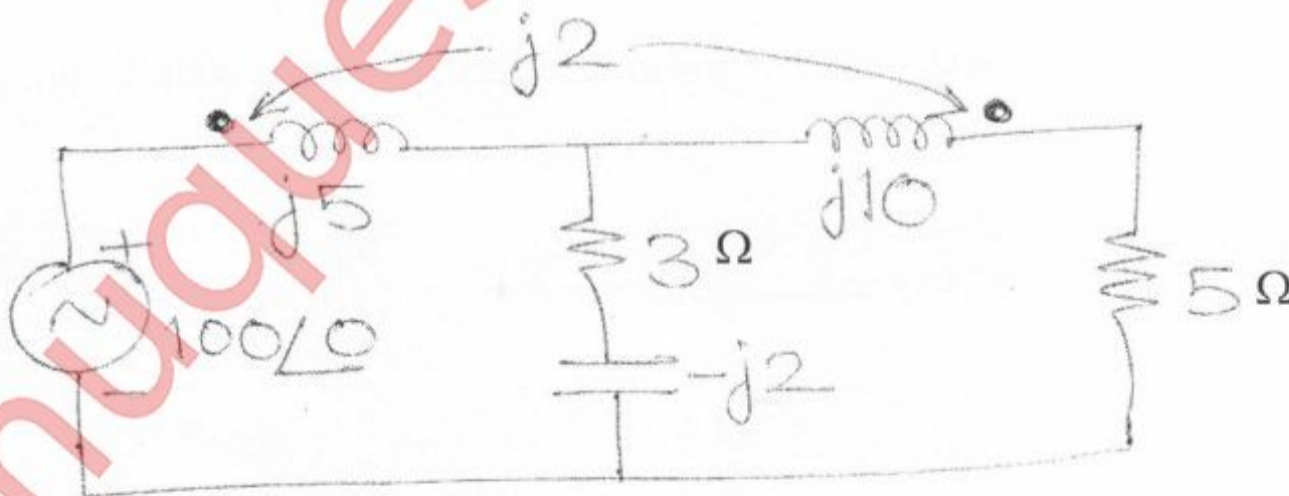
2. (a) Find V_x using superposition theorem.

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2. (b) Find voltage across 5Ω resistor.

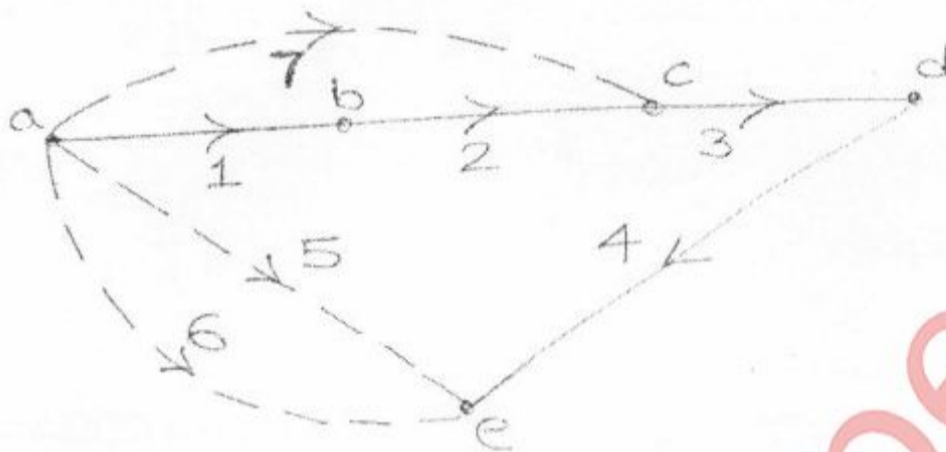
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3. (a) For given tree, find
 (i) Incidence Matrix (ii) f-cutset matrix

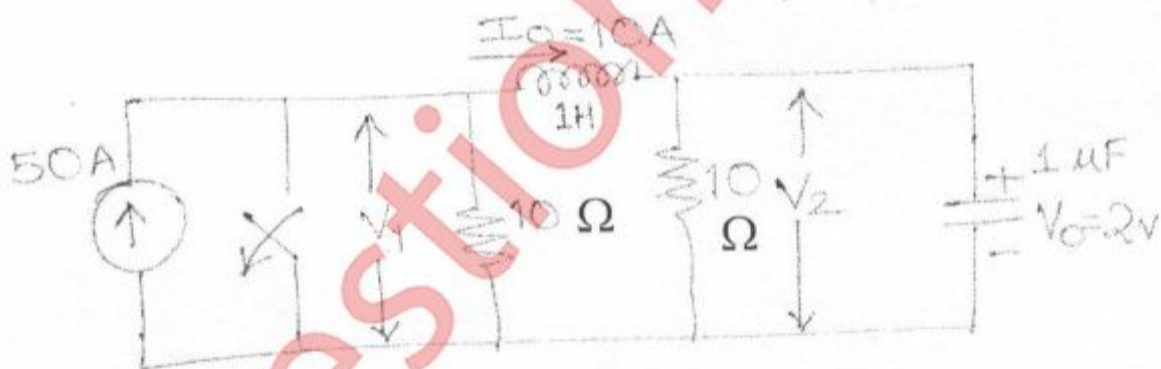
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- (b) For the network given below, switch is opened at $t = 0$ with initial conditions shown. Find the values of

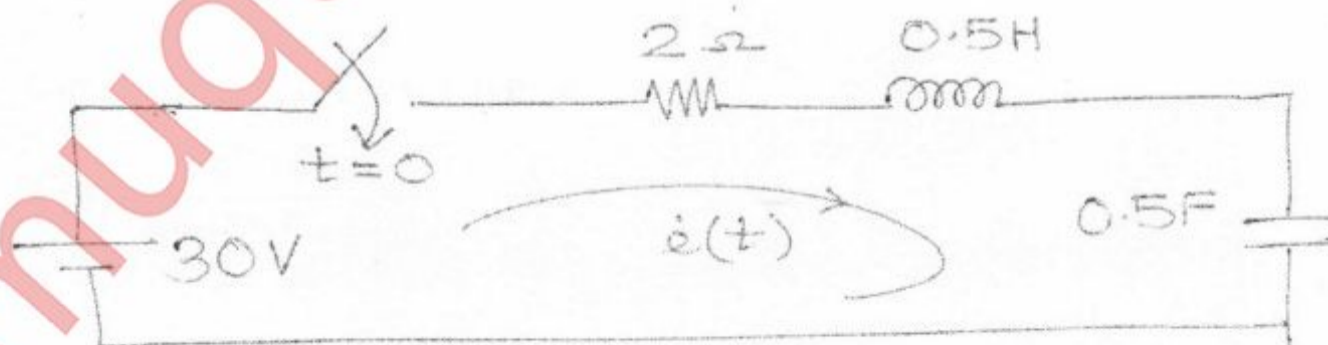
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$$V_1, V_2, \frac{dv_1}{dt}, \frac{dv_2}{dt} \text{ at time } t = 0^+$$



4. (a) Obtain $i(t)$ for the network shown. Use time domain approach.

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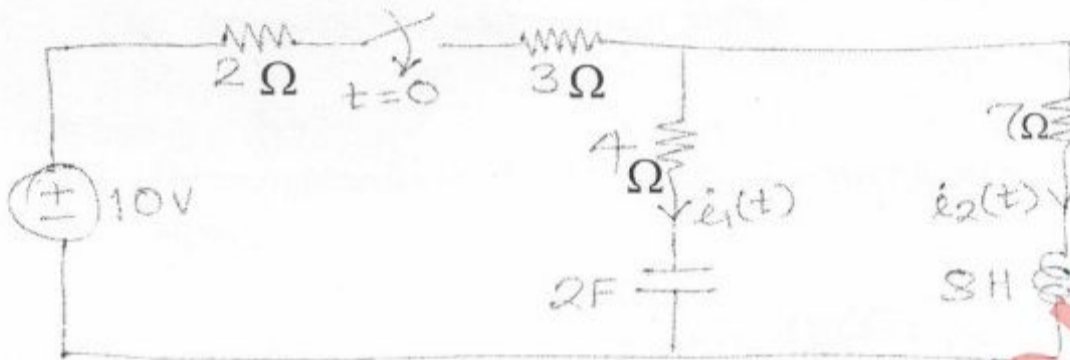


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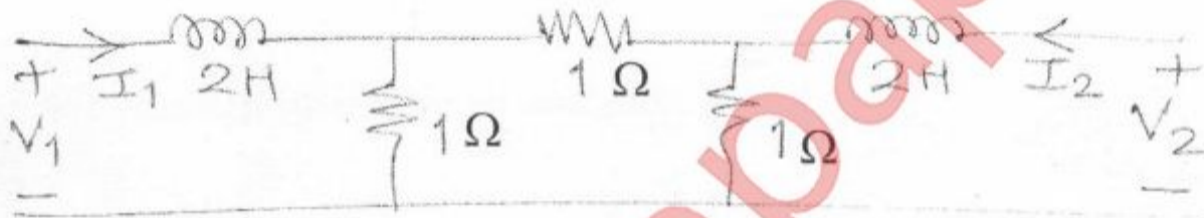
(b) Determine $i_1(t)$ and $i_2(t)$

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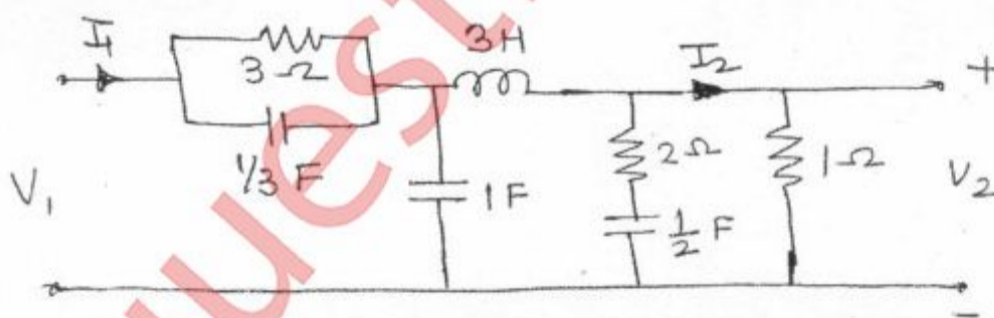


5. (a) Find ABCD parameter

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(b) Determine $\frac{I_2}{I_1}$ for network



6. (a) Check for positive real function.

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$$F(s) = \frac{2s^2 + 2s + 1}{s^3 + 2s^2 + s + 2}$$

(b) $Y(S) = \frac{4(s^2 + 4)(s^2 + 25)}{s(s^2 + 16)}$

10

Find Foster II and Cauer I forms.