S.E. (ETRX) Sem III (R) 30/12/09

Con. 5705-09. (REVISED COURSE) SP-7352

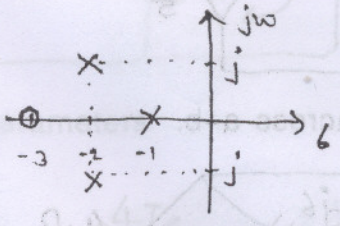
(3 Hours) [Total Marks : 100

Lib Electrical Network Analysis & Synthesis

2.30 to 5.30

N.B. : (1) Question No. **1** is **compulsory**.
(2) Solve any **four** questions from Q. Nos. **2** to **7**.
(3) Assume **suitable** data if **necessary**.

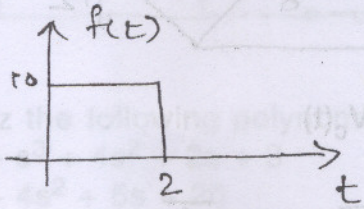
1. (a) Determine the network function if d.c. gain of the system is 10 and p–z diagram is as shown – 4



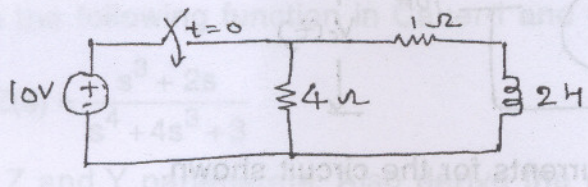
(b) State the properties of positive real function. 4

(c) Express transmission parameters in terms of Z-parameters. 4

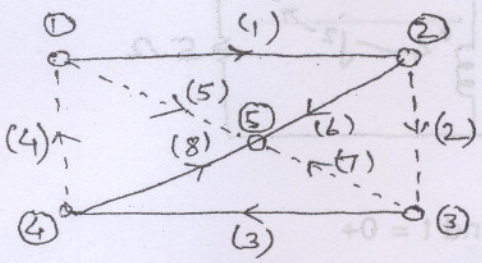
(d) Find the Laplace transform of the waveshape shown. 4



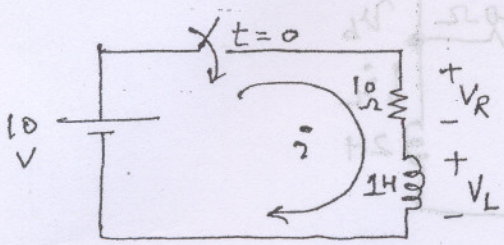
(e) What is time constant of the circuit ? Find the same for the circuit shown. 4



2. (a) Write A, B and Q matrices for the graph shown. 10



(b) At what time does $V_R = V_L$ 10



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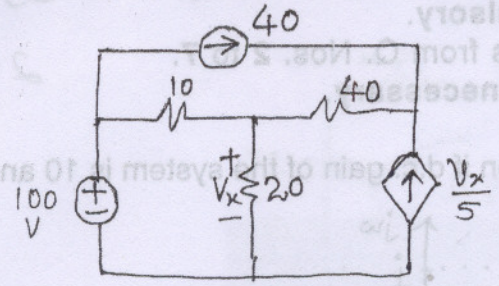
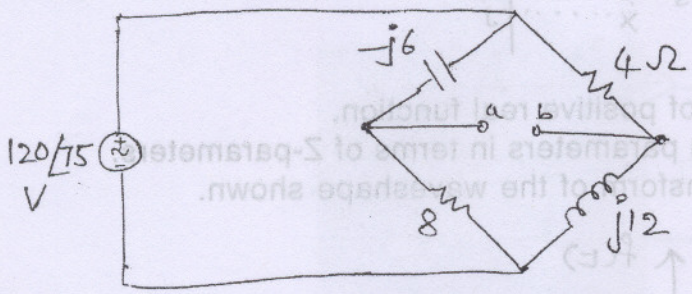
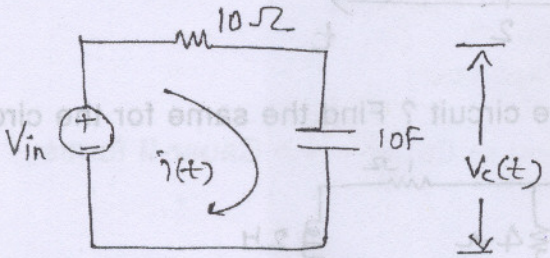
3. (a) Find magnitude of VCCS by Mesh Analysis. **10**



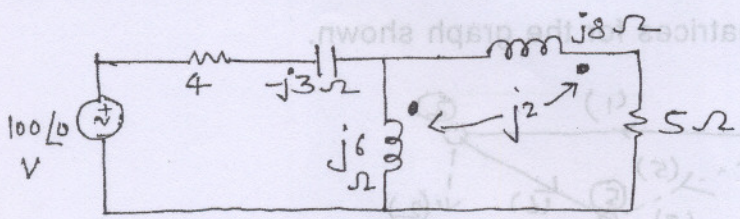
(b) Find Thevenin's equivalent across a–b: **10**



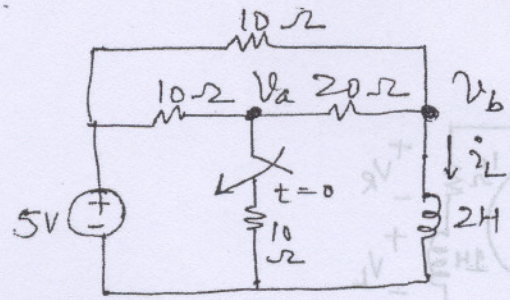
4. (a) For a unit ramp input find $V_c(t)$ **10**



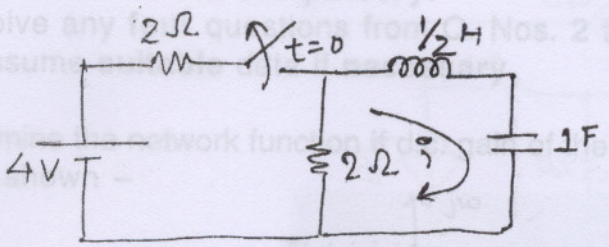
(b) Calculate the Mesh currents for the circuit shown. **10**



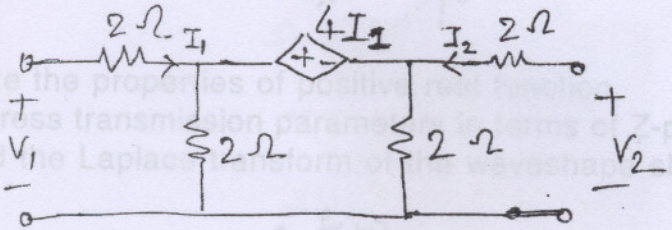
5. (a) Find V_a and V_b at t = 0– and t = 0+ **10**



(b) Find i(t) for t > 0 10



6. (a) Find Z and h – parameters 10



(b) Check for Hurwitz the following polynomials : 10

(i) $P(s) = s^4 + s^3 + 4s^2 + 2s + 3$

(ii) $P(s) = s^3 + 4s^2 + 5s + 20$

Use Continued Franction Expansion.

7. (a) Realize the following function in Cauer-I and Cauer-II forms. 10

$$Z(s) = \frac{s^3 + 2s}{s^4 + 4s^3 + 3}$$

(b) Define Z and Y parameters. Also derive the condition for RECIPROCITY for Z-parameters. 10