M 21813

Reg. No. : ....

Name : ....

Third Semester B.Tech. (Reg./Sup./Imp.) (Including Part-Time) Degree Examination, November 2012
PT2K6/2K6EC/AEI 305 : NETWORK THEORY
(2007 Admn. Onwards)

Time : 3 Hours Max. Marks : 100

***Instructions :** 1) Answer **all** questions.*
*2) Assume **missing** data.*

1. a) Find the magnitudes of the unknown currents for the circuit shown in figure 1. (a).

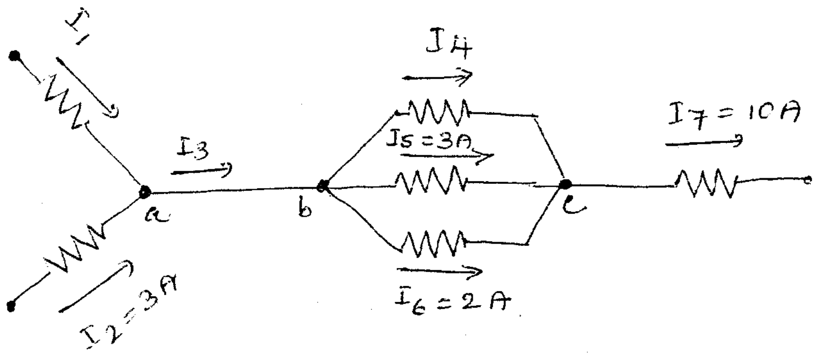

figure 1.(a).

b) Determine the nodal voltages for the circuit shown in figure 1. (b).

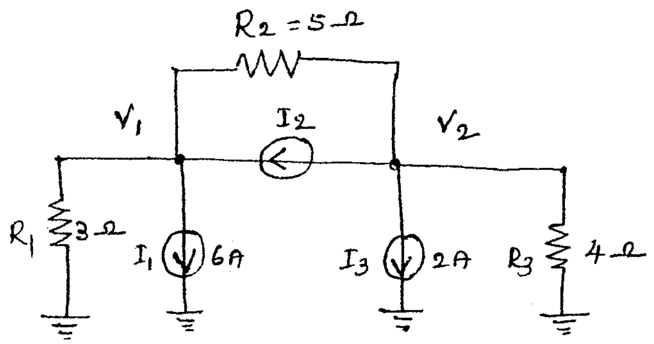

figure 1.(b).

c) Find $L\{e^{-at}\cos\omega t\}$ using definite integrals.

P.T.O.

d) Find : L {(t – a) u(t – a)} using definite integrals.

e) Define ABCD parameters and obtain the values of A, B, C and D for a simple two port network.

f) Determine the z-parameters of the T-circuit shown in figure 1. (f).

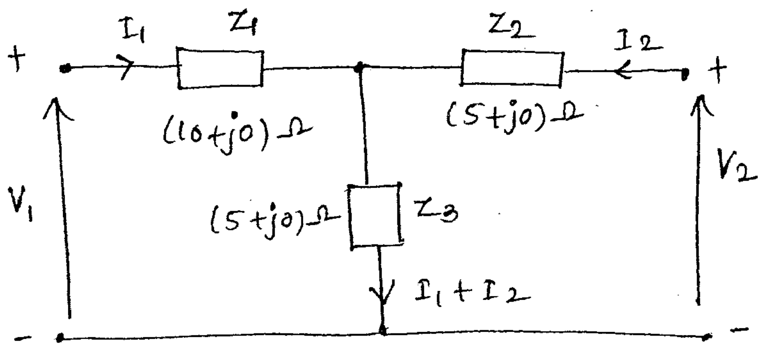

figure 1.(f).

g) Write short note on LC network synthesis.

h) Write short note on properties of positive real functions.

(8×5=40)

2. a) i) For the circuit shown in figure 2(a) determine the impedance Z_L that results in maximum overage power transferred to Z_L. **15**

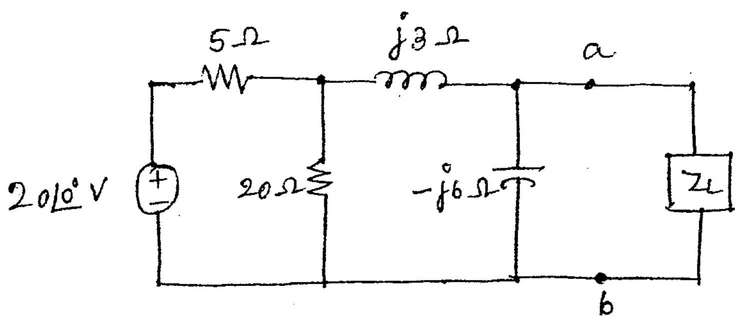

figure 2.(a).

ii) What is the maximum average power transferred to the load impedance determined in (i).

OR

b) Use Thevenin's theorem to determine the current flowing in the capacitor of the network shown in figure 2.(b). **15**

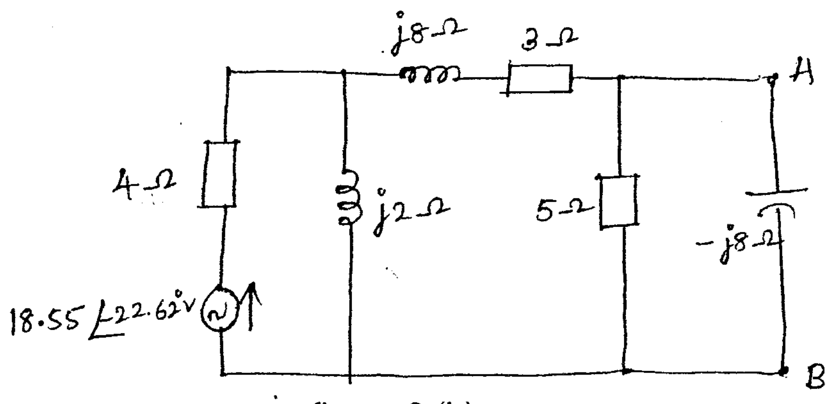

figure 2.(b).

3. a) State and prove initial and final value theorem. Also find f(t) if

$F(s) = \dfrac{7s^2 + 63s + 134}{(s+3)(s+4)(s+5)}$ using initial and final value theorems. **15**

OR

b) The dc current and voltage sources are applied simultaneously to the circuit shown in figure 3.(b) no energy is stored in the circuit at the instant of application

i) Derive the s-domain expressions for V_1 and V_2.

ii) For $t > 0$ derive the time-domain expression for V_1 and V_2.

iii) Calculate $V_1(0^+)$ and $V_2(0^+)$

iv) Compute the steady-state values of V_1 and V_2.

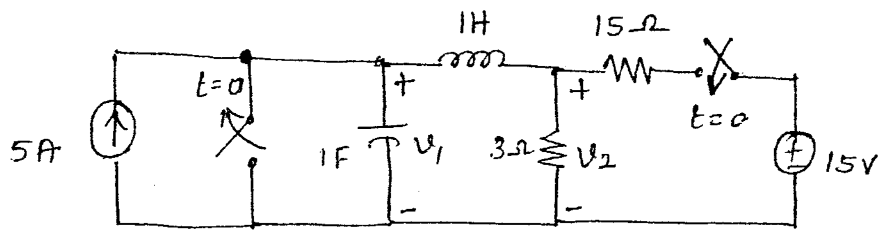

figure 3.(b). **15**

4. a) Each element in the symmetric bridged tee circuit shown in a figure 4.(a) is 15Ω resistor. Two of these bridged tees are connected in cascade between a dc voltage source and a resistive load. The dc voltage source has a no load

voltage of 100V and an internal resistance of 8 Ω. The load resistor is adjusted until maximum power is delivered to the load. Calculate (a) the load resistance (b) the load voltage (c) load power. **15**

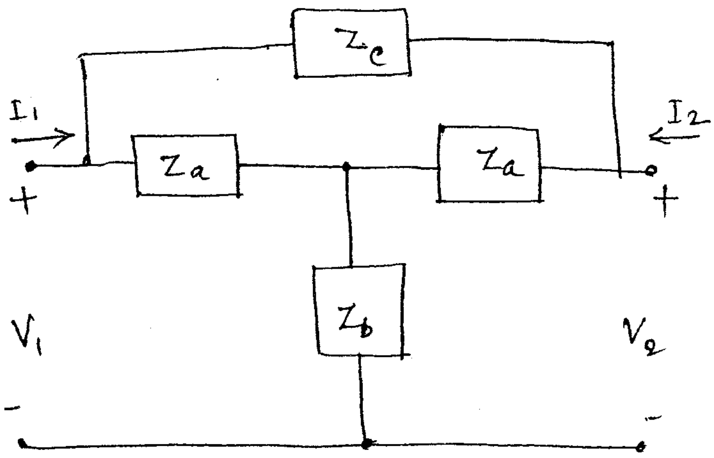

figure 4.(a).

OR

b) Find the relationship b/n g parameters and h parameters. Also using the same relationship find g and h parameters for the circuit as shown in figure 4.(b). **15**

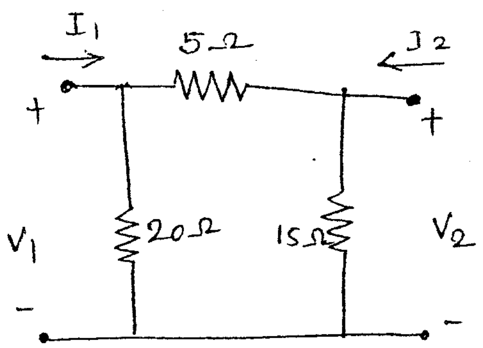

figure 4.(b).

5. a) With the help of an example explain the procedure to test wether the polynomial is Hurwitz or not. **15**

OR

b) i) Write short note on even and odd functions. **7**

ii) Write short note on application of maximum module theorem. **8**