

Enrollment No:- \_\_\_\_\_

Exam Seat No:- \_\_\_\_\_

**C.U.SHAH UNIVERSITY**  
**Summer-2015**

Subject Code: 4TE03NAS1 Subject Name: Network Analysis

Course Name: B.Tech(EC)

Date: 6/5/2015

Semester:III

Marks: 70

Time:02:30 TO 05:30

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**Instructions:**

- 1) Attempt all Questions of both sections in same answer book/Supplementary.
  - 2) Use of Programmable calculator & any other electronic instrument prohibited.
  - 3) Instructions written on main answer book are strictly to be obeyed.
  - 4) Draw neat diagrams & figures (if necessary) at right places.
  - 5) Assume suitable & perfect data if needed.
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**SECTION – I**

- Q.1 (a) What is RMS? Write Equation for it. 02  
(b) How inductor and capacitor will behave at  $t = 0$  and at  $t = \infty$ . Draw Equivalent networks. 02  
(c) Explain (1) Direct Sources (2) Alternating Sources 02  
(d) Explain: Form Factor. 01

- Q.2 (a) Explain star to Delta conversion and convert star into delta with suitable Example. 05  
(b) Find  $i_1$ ,  $i_2$ ,  $i_3$  and  $i_4$  in Fig 1 using current division method. 05  
(c) In circuit configuration of Fig 2, Determine, the number of (i) circuit elements 04  
(ii) nodes (iii) Junction points (iv) branches

**OR**

- Q.2 (a) In the Fig 3, find “v” and the magnitude and direction of the an known currents in the branches  $x_n$ ,  $y_n$ , and  $z_n$ . 05  
(b) State and explain Maximum Power Transfer Theorem. 05  
(c) Define (i) Node (ii) Junction (iii) Branch (iv) Loop. 04

- Q.3 (a) Explain Series Resonance and state properties of RLC series circuit. 05  
(b) Discuss substitution theorem and steps for solution of a network using this theorem. 05  
(c) State and explain various Network Functions. 04

**OR**

- Q.3 (a) State and explain Norton's Theorem theorem in brief giving suitable examples. 05  
(b) Explain: Parallel Resonance of RLC Circuits with suitable Voltage and Current Variation with frequency relationship. 05  
(c) Discuss Duality in detail. 04



**SECTION – II**

- Q.4 (a) Explain the terms.
- |                         |   |
|-------------------------|---|
| (i) Active Network      | 1 |
| (ii) Passive Network    | 1 |
| (iii) Linear Circuit    | 1 |
| (iv) Non-Linear Circuit | 1 |
| (v) Unilateral Circuit  | 1 |
| (vi) Lumped Network     | 1 |
| (vii) Bilateral Circuit | 1 |

- Q.5 (a) Find the Z-parameters for the following network shows in fig 4. 05  
 (b) In the circuit shown fig 5, find the h-parameter. 05  
 (c) Explain transient response of RLC circuit with dc and sinusoidal excitation (second order circuit). 04

**OR**

- Q.5 (a) State and explain the Initial and final value theorem. 05  
 (b) Draw any possible trees with suitable example circuit diagram. Also Find incident matrix for the graph. 05  
 (c) Find the value of  $i_0(t)$  using Laplace shown in Fig.6 04

- Q.6 (a) Find the Y-parameter of the following  $\pi$  circuit (Fig 7) and draw the Y-parameter model. 05  
 (b) Explain different terminology used in network graph theory and also show relation between Twigs and Links. 05  
 (c) Explain The Laplace Transformation method. Find Laplace Transform of Unit Step, and exponential function. 04

**OR**

- Q.6 (a) Explain the short-circuit admittance and the open-circuit impedance Parameters for a two port network. 05  
 (b) Draw and explain step response of series RLC circuit and step current response of parallel RLC circuit. 05  
 (c) Explain formation of incidence matrix with suitable example. Give properties of incidence matrix. 04

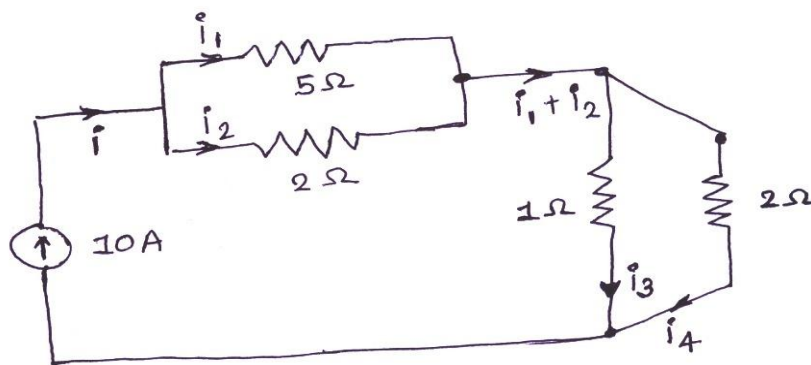


FIG (1)



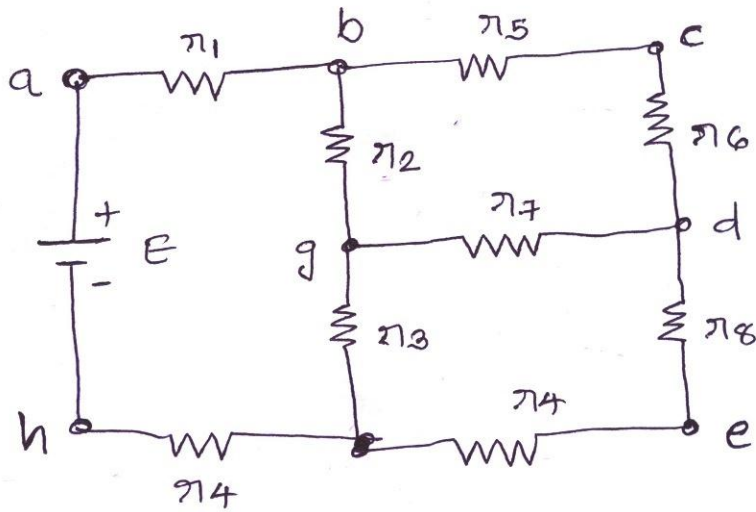


FIG (2)

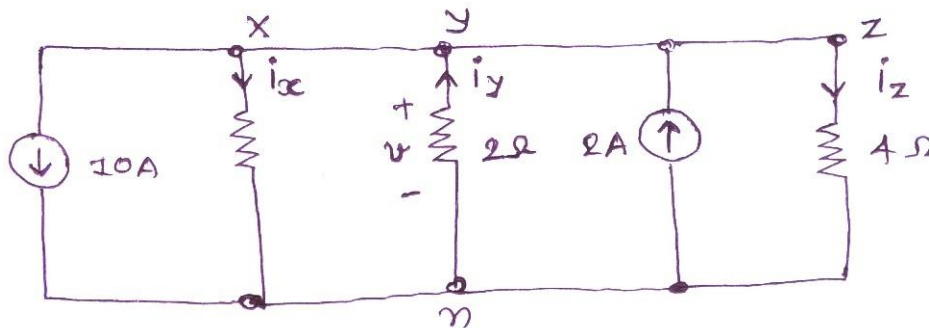


FIG (3)

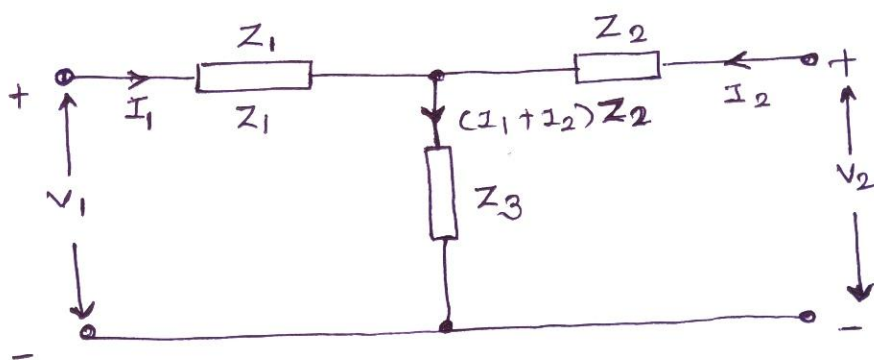


FIG (4)

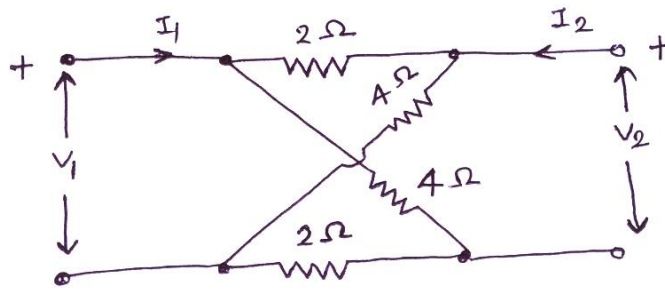


FIG (5)

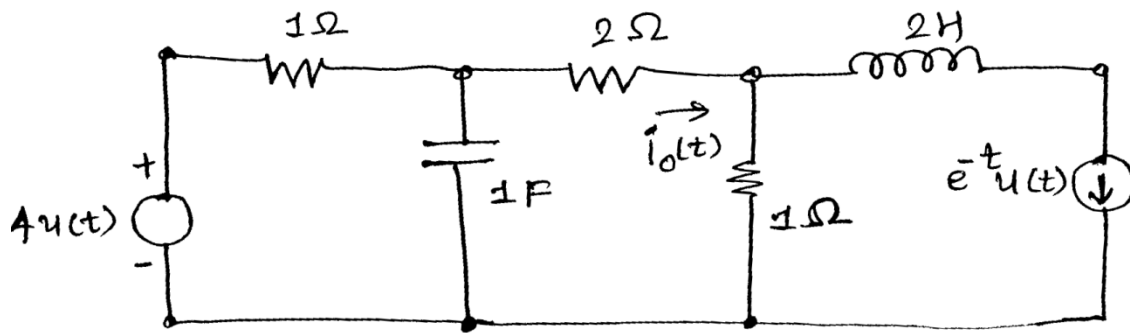


FIG (6)

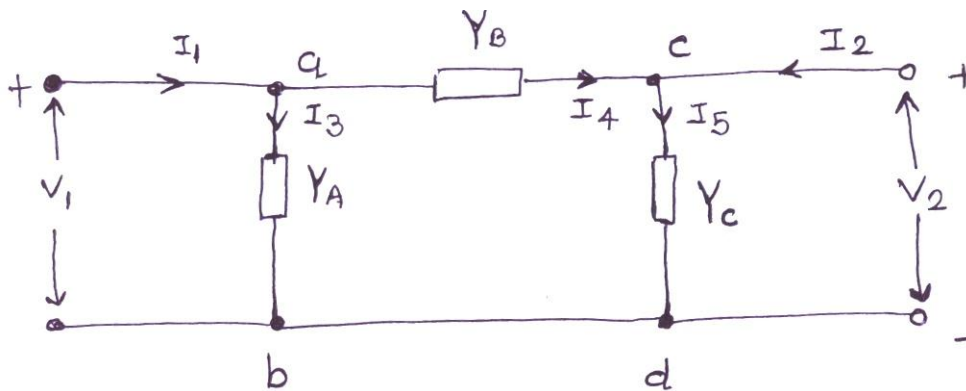


FIG (7)