Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name: Network Analysis

Subject Code: 4TE03NAS1 **Branch: B. Tech (EC)**

Semester: 3 **Date: 26/04/2016** **Time: 02:30 To 05:30** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Define the following terms:** **(14)**

a) Circuit.
b) Network.
c) Node.
d) Junction.
e) Passive network.
f) Active network.
g) Independent source.
h) Dependent source.
i) Graph
j) Tree
k) Incident matrix

State the following theorems:

l) State the Thevenin's theorem
m) State the Norton's theorem.
n) State the reciprocity theorem.

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

(a) Determine the current through 4Ω resistor branch of the network given in Fig-1 using mesh analysis. **09**

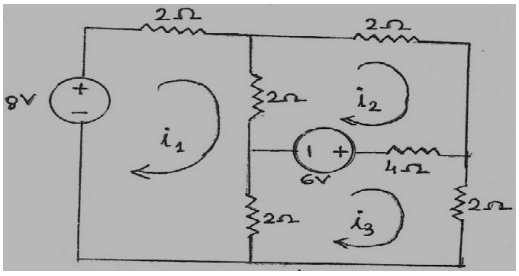

Fig-1

(b) What are the relationship between voltage and current and voltage for R, L and C? Also mention the initial and final condition for R, L and C components in the different conditions. **05**

Q-3 **Attempt all questions** **(14)**

(a) For the given network in Fig- 2, switch K is changed from position 1 to 2 at time t = 0. Find out the value of i, di / dt and d^2i / dt^2 at $t = 0^+$. Assume that steady state having been reached before switching. **07**

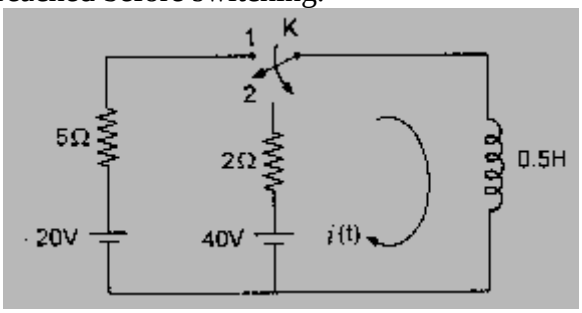

Fig -2

(b) For the given network in Fig-3, switch k is closed at time t = 0. Find out the particular solution for the current i(t). **07**

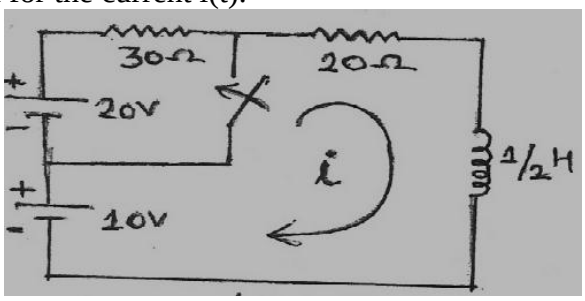

Fig - 3

Q-4 **Attempt all questions** **(14)**

(a) State the superposition theorem. Find the voltage across 1KΩ resistor in the circuit shown in Fig -4, using superposition theorem. **07**

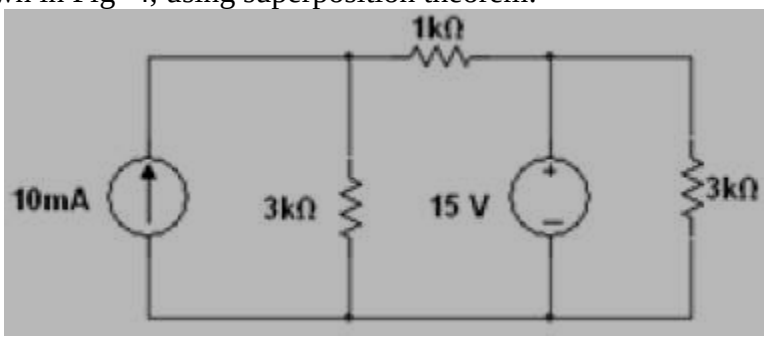

Fig -4

(b) In the network of Fig.-5, the switch K is moved from position a to b at t=0 (Steady state existing). Solve for the current i(t) using Laplace transformation method. Use R = 10Ω, L = 1H, C = 1F. **07**

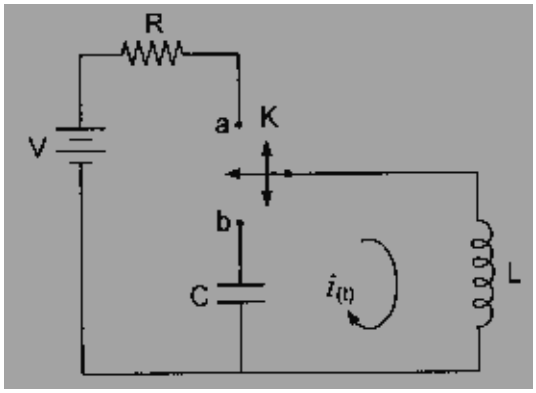

Fig -5

Q-5 **Attempt all questions** **(14)**

(a) Explain the various types of Interconnections of the Two port networks in brief. **07**

(b) State and prove maximum power transfer theorem with suitable examples. **07**

Q-6 **Attempt all questions** **(14)**

(a) Derive the expression for z-parameters in terms of g -parameters and vice versa. **07**

(b) Find the z-parameters for the given network in Fig-6. **07**

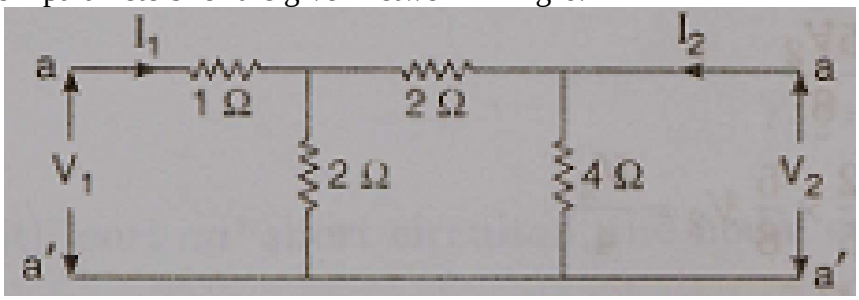

Fig -6

Q-7 **Attempt all questions** **(14)**

(a) Write short note on series resonance **07**

(b) A 220v, 100Hz ac source supplies a series RLC circuit with a capacitor and a coil. If the coil has 50 mΩ resistance and 5 mH inductance, find, at a resonance frequency 100 Hz what is the value of capacitor. Also calculate the Q factor and half power frequencies of the circuit. **07**

Q-8 **Attempt all questions** **(14)**

(a) Explain the concept of poles and zeros and their significance.

(b) Explain necessary conditions for driving-point functions