Total No. of Questions :5] [Total No. of Printed Pages : 7

Roll No ....

EC - 305

B.E. III Semester

Examination, June 2015

Network Analysis

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

UNIT - I

1. a) Simplify the network shown in Fig. 1 using source transformation method.

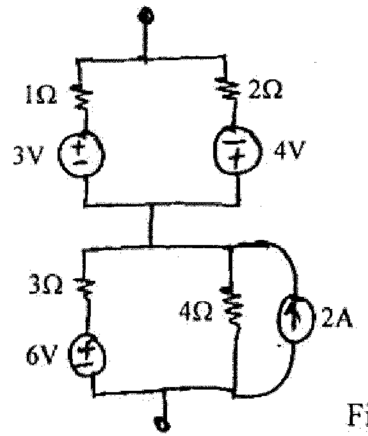

Fig. 1

b) What do you mean by controlled sources?

c) For the circuit shown in Fig. 2 determine the current through 3Ω resistor.

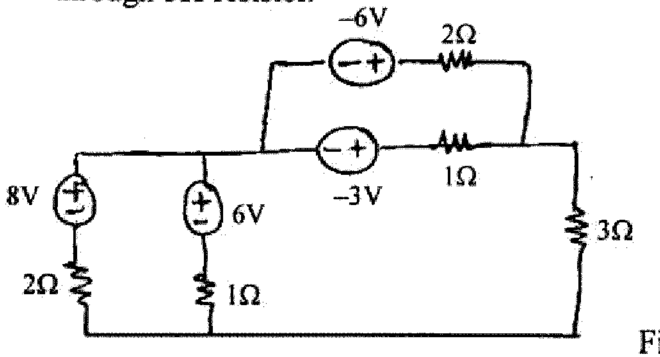

Fig. 2

d) Write the three loop equations for the magnetically coupled circuit shown in fig. 3.

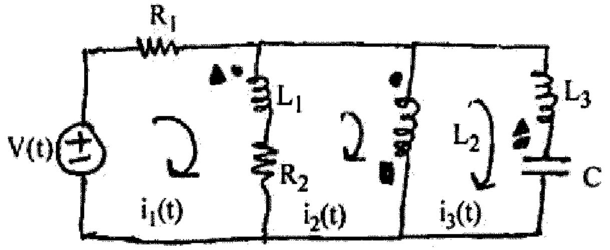

Fig. 3

OR

Define the following :

i) Dual Network

ii) Resonance Frequency

iii) Coupling coefficients

UNIT -II

2. a) State and explain the Norton Theorem.

b) State and prove maximum power transfer theorem.

c) Explain the following :

i) Branch and Node

ii) Incidence matrix

iii) Subgraph

d) For the Network Shown in Fig. 4 determine the current I using Millman's theorem.

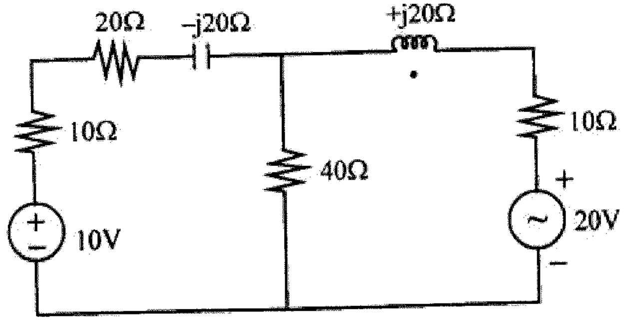

Fig. 4

OR

By Superposition theorem, calculate the current I in the circuit shown in fig. 5.

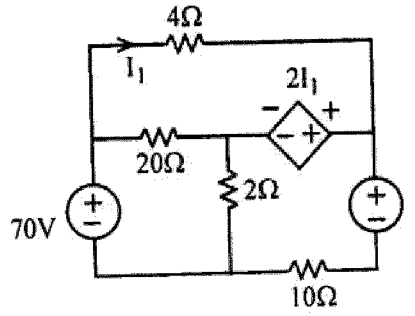

Fig. 5

UNIT - III

3. a) Discuss initial conditions in different network elements.

b) Consider a Series R-C circuit as shown in fig. 6 the switch S is closed at time t=0. Find the current i(t).

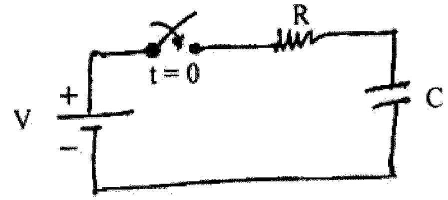

Fig. 6

c) In the network shown in Fig. 7 Switch S is closed at t=0. Determine the current as a function of time.

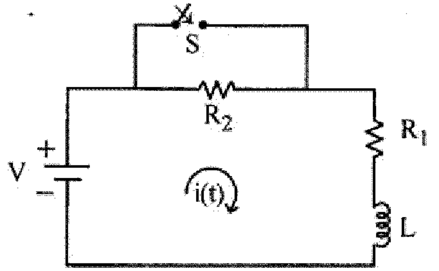

Fig. 7

d) In the network shown in fig. 8 the switch k is closed at t=0. Determine, $i(0^+)\ \frac{di}{dt}(0^+)$ and $\frac{d^2i}{dt^2}(0^+)$.

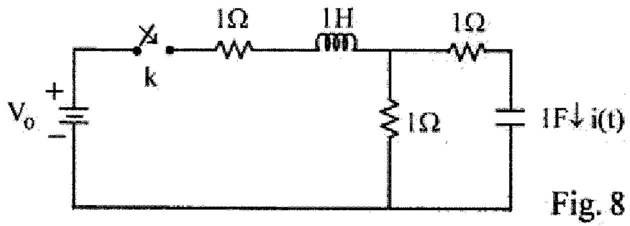

Fig. 8

OR

In the circuit shown in the fig. 9 the switch is moved from position 1 to position 2 at t = 0 having been in position 1 for a long time before t = 0. Capacitor C_2 in unchanged at t =0.

i) Find the particular solution of i (t) for t > 0.

ii) Find the particular solution of V_2 (t) for t > 0.

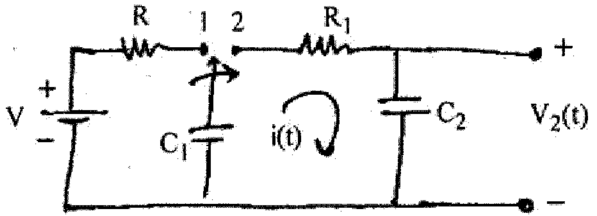

Fig. 9

UNIT - IV

4. a) Find the Laplace transform of sin ωt.

b) Verify the final value theorem for the function $f(t) = 2 + e^{-3t}\cos 2t$.

c) Determine the equation for voltage V(t) and obtain its Laplace transform shown in fig. 10.

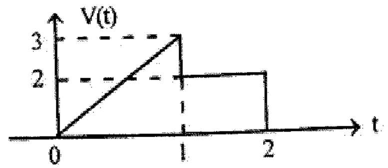

Fig. 10

d) Find the trigonometric Fourier series for the square wave shown in the fig. 11 and plot the spectrum.

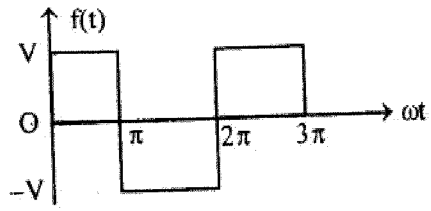

Fig. 11

OR

Obtain the Fourier Series of the wave form shown in the fig. 12 and plot the amplitude and phase spectrum.

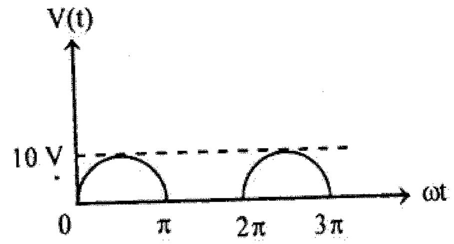

Fig. 12

UNIT - V

5\. a) Find driving point admittance function for the given network having only one port. Shown in the fig. 13.

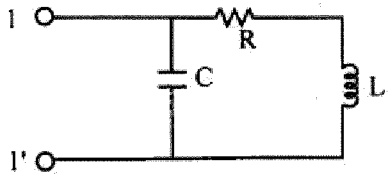

Fig. 13

b) Give the condition of symmetry in ABCD and h-parameters.

c) Determine the Z and h-parameters of the network shown in fig. 14.

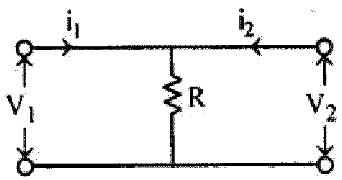

Fig. 14

d) Obtain the open circuit Z parameters of the network shown in the fig. 15.

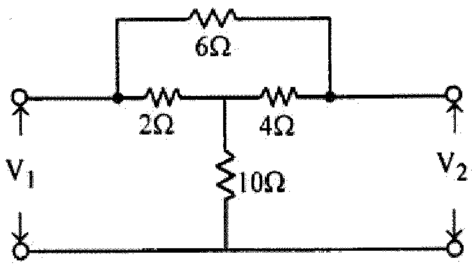

Fig. 15

OR

The network of Fig. 16 contains both a dependent current source and a dependent voltage source. For the element values given, determine the y parameters.

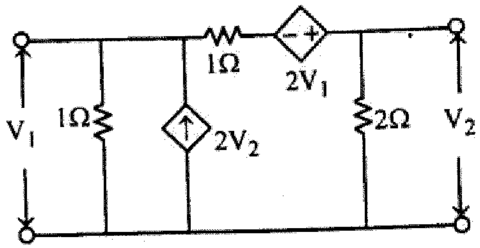

Fig. 16

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