b) For the network shown in Fig-12, find the voltage-ratio transfer function, $G_{12}(s) = \frac{V_2(s)}{V_1(s)}$.

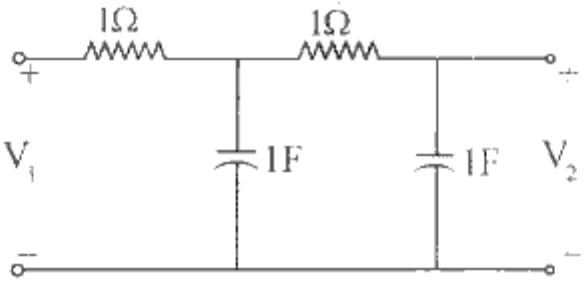

Fig. 12

OR

10. For the network shown in Fig-13 , determine the open-circuit impedance parameters (z) and transmission parameters (A, B, C, D)

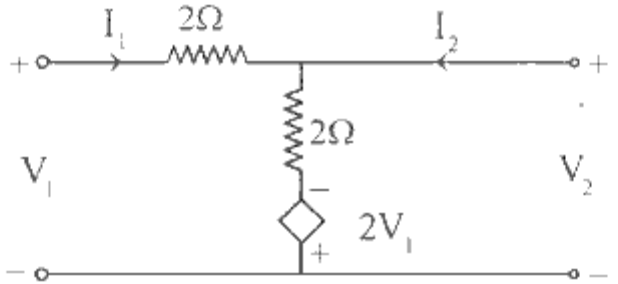

Fig. 13

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Roll No .....

EE/EI/EX/BM - 305

B.E. III Semester

Examination, December 2013

Network Analysis

Time : Three Hours

Maximum Marks : 70

Note : 1. Answer five questions, selecting One question from each unit.
2. All questions carry equal marks.

Unit - I

1. a) Explain series and parallel resonance.

b) Find the current through 20ohms resistor in the network shown in Fig. 1.

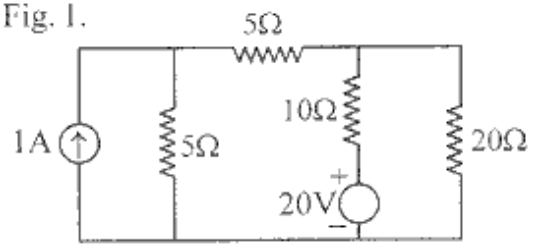

Fig. 1

OR

2. a) Write down the complete incidence matrix for the graph shown in Fig. 2.

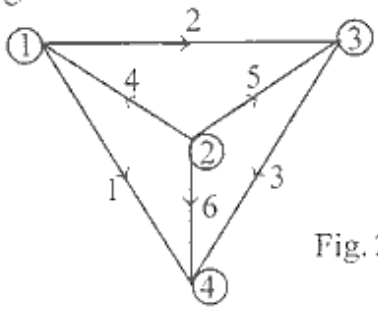

Fig. 2

b) In the network shown in Fig. 3, switch 'k' is changed from position 'a' to 'b' at $t = 0$. Find $i(0+)$ and $\frac{di}{dt}(0+)$.

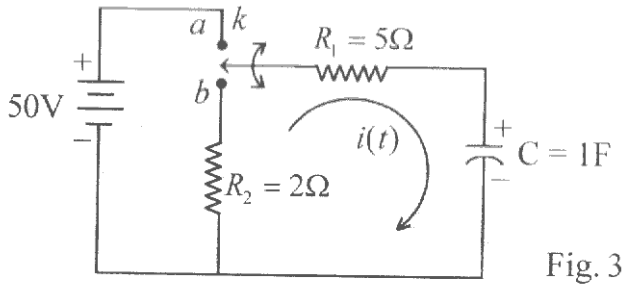

Fig. 3

Unit - II

3. a) State and explain the following:-
   i) Norton's theorem
   ii) Millman's theorem

   b) Using Thevenin's theorem, find the power dissipated in $(2+j3)\Omega$ impendance connected across the terminals AB, in the network shown in Fig. 4.

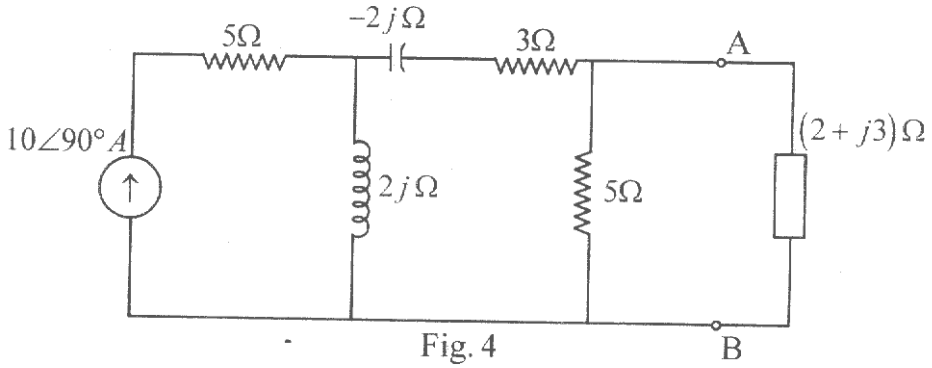

Fig. 4

OR

4. a) State and explain
   i) Reciprocity theorem
   ii) Substitution theorem

   b) Determine the current I through –j2Ω branch, using superposition theorem, for the network shown in Fig-5.

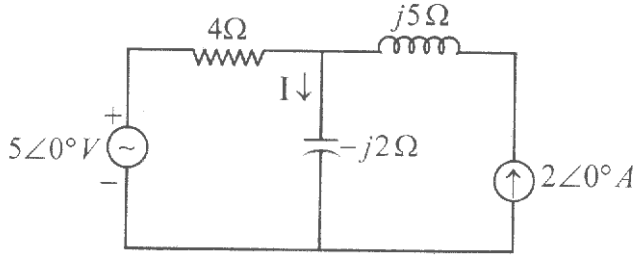

Fig. 5

Unit - III

5. a) The waveform shown in Fig. 6, occurs only once. Write an expression for $v(t)$. Find the transform $V(s)$ for $v(t)$.

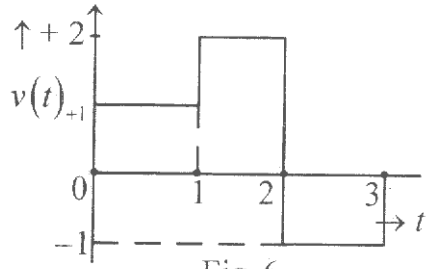

Fig. 6

   b) A unit impulse function of voltage, $v(t) = \delta(t)$ is applied at t = 0 to a series R,C network as shown in Fig-7. Assuming zero initial conditions find $i(t)$.

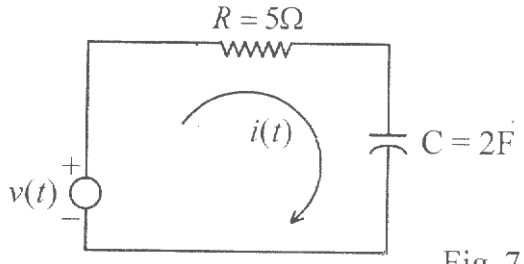

Fig. 7

OR

6. a) Obtain the S-domain equivalent circuit for an inductor with initial current.

   b) In the network shown in Fig-8, the switch 'K' has been in position '1' for a long time. It is moved to position '2' at time t=0. Find an expression for $i(t)$, using Laplace transform method.

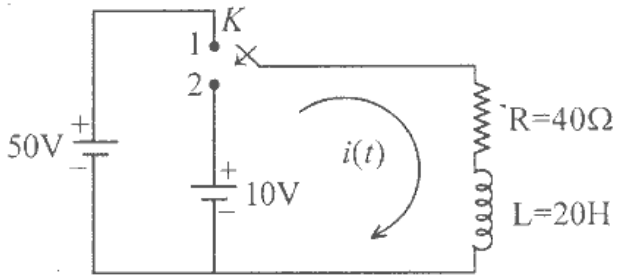

Fig. 8

Unit - IV

7. a) What is the effect of symmetry for a periodic function to determine the Fourier series co-efficients?

   b) The waveform shown in Fig-9 consists of a train of isosceles triangles. For this waveform, determine the Fourier co-efficients and plot the corresponding amplitude and phase spectra.

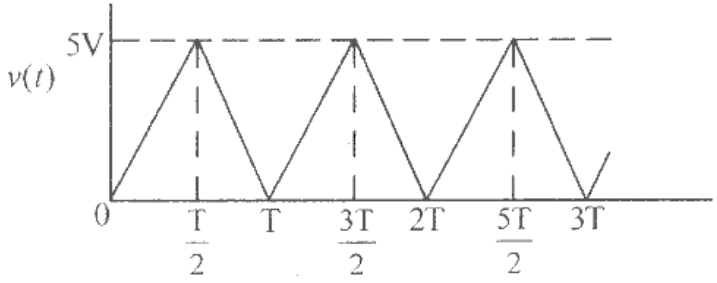

Fig. 9

OR

8. a) What are the Dirichlet conditions for Fourier-series representation?

   b) Fig-10 shows a square-wave voltage signal. Find the trigonometric Fourier-series and plot the line spectrum. The waveform is written:

$$v(t)=\begin{cases} V, & 0<t<T/4 \\ -V, & \frac{T}{4}<t<\frac{3T}{4} \\ V, & \frac{3T}{4}<t<T \end{cases}$$

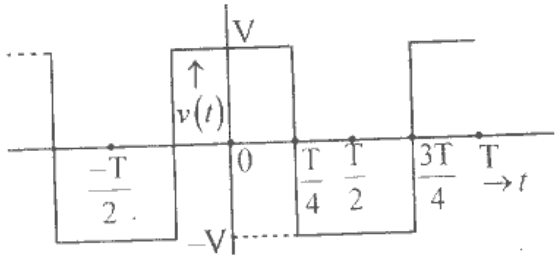

Fig. 10

Unit - V

9. a) For the network shown in Fig-11, Find the driving point impedance, Z(s). Locate the poles and zeros of this impedance function in S-Plane.

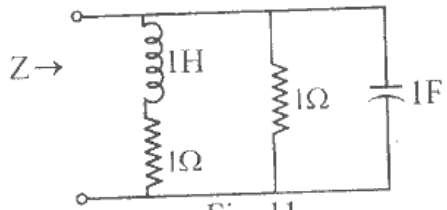

Fig. 11