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6. Determine the Fourier series of the waveform shown in figure 9.

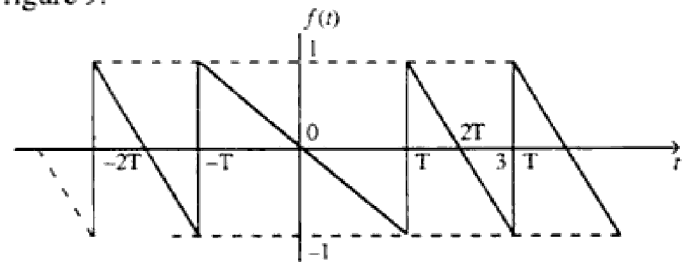

Figure 9

7. a) Determine the Z-parameters of the network shown in figure 10.

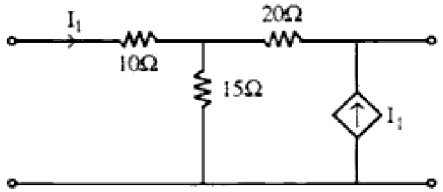

Figure 10

b) Obtain the Z-parameters of the network shown in figure 11.

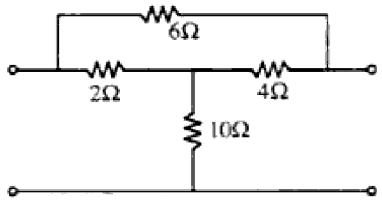

Figure 11

8. Write short notes on any two of the following :
   a) Series and Parallel resonance
   b) Maximum power transfer theorem
   c) Hybrid parameters

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Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

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EE/EI/IC/EX-305

B.E. III Semester

Examination, December 2016

Network Analysis

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) In the circuit of figure 1 the switch S is moved from position 1 to 2 at $t = 0$, having been in position 1 for a long time before $t = 0$. Capacitor C_2 is uncharged at $t = 0$.
   i) Find the particular solution for $i(t)$ for $t > 0$.
   ii) Find the particular solution for $V_2(t)$ for $t > 0$.

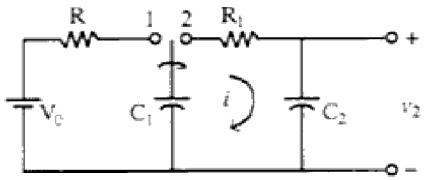

Figure 1

b) In the circuit of figure 2, the switch S is open and the circuit reaches a steady state. At $t = 0$ the switch S is closed. Find the current in the inductor for $t > 0$.

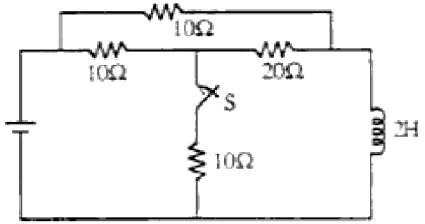

Figure 2

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2. a) In the circuit of figure 3 the switch is opened at $t = 0$. Find the following quantities at $t = 0^+$.

i) v_1 ii) v_2

iii) $\frac{dv_1}{dt}$ iv) $\frac{dv_2}{dt}$

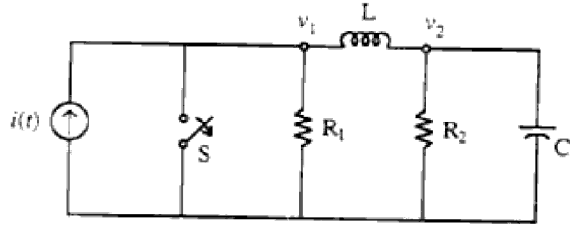

Figure 3

b) In the circuit shown in figure 4, the capacitor C_1 is charged to voltage V_0 and the switch S is closed at $t = 0$. When $R_1 = 2M\Omega$, $V_0 = 1000V$, $R_2 = 1M\Omega$, $C_1 = 10\ \mu F$ and $C_2 = 20\ \mu F$, solve for i_2, $\frac{di_2}{dt}$ and $\frac{d^2i_2}{dt^2}$ at $t = 0^+$.

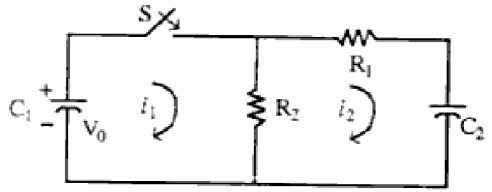

Figure 4

3. a) Find the Norton equivalent circuit across terminal AB of the circuit shown in figure 5.

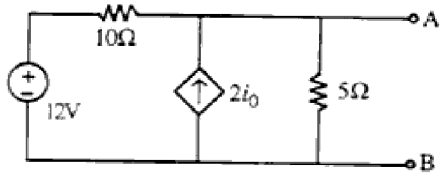

Figure 5

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b) Find the value of Z_L to have maximum power transfer from $10\angle 0°V$ voltage sources. Also determine the amount of maximum power in figure 6.

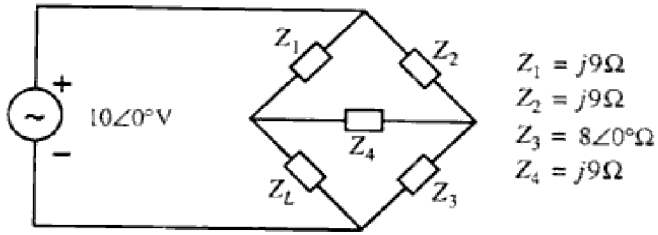

Figure 6

4. a) State and prove superposition and reciprocity theorem.

b) State and prove Millman's theorem and Tellegen's theorem.

5. a) In the circuit of figure 7, the switch S is closed at $t = 0$ with the capacitor initially unenergised for the numerical values given find $i(t)$

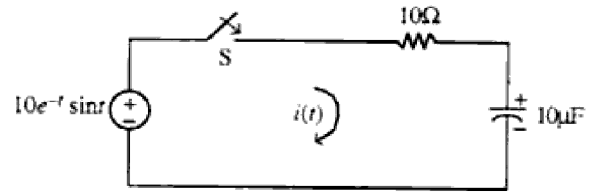

Figure 7

b) Find the Laplace transform of the waveforms shown in figure 8.

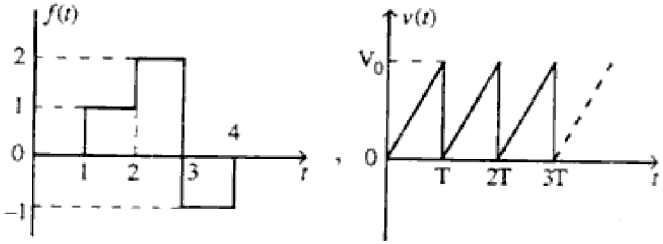

Figure 8 (a, b)

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