Code No: S9505 **RA**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2017
NETWORK THEORY
(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Explain the procedure and necessary formulas for star to delta and delta to star conversion of 3ϕ balanced loads.

b) The balanced load in figure 1 shown below is fed by a balanced three-phase system having $V_{ab} = 230\angle 0^0$ V rms and positive phase sequence. Find the reading of each wattmeter and the total power drawn by the load. [7+8]

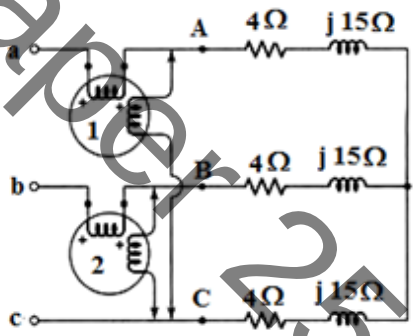

Figure 1

2.a) A simple RL circuit as shown in below figure 2, the swtich is opened at time t = 0 sec. Find the current response $i_L(t)$ valid for time t > 0 sec.

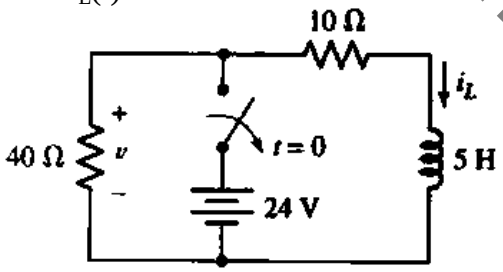

Figure 2

b) Find the capacitor voltage $v_C(t)$ and the current i(t) in 200 Ω resistor, valid for all time, in the circuit shown in below figure 3. [7+8]

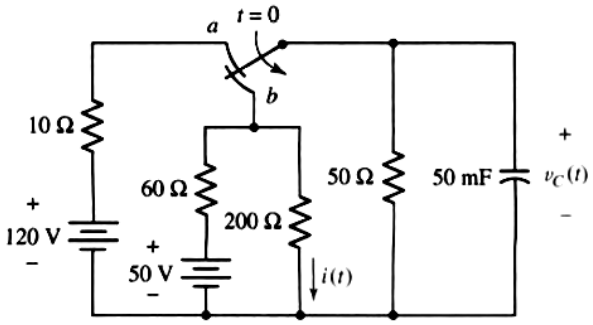

Figure 3

3. Find the current i_L in the circuit shown in figure 4 below using Laplace Transforms. [15]

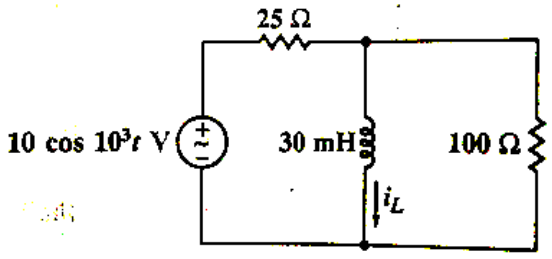

Figure 4

4.a) What do you understand by Network Functions? Define any four basic Network Functions.

b) For the two-port network shown in figure 5 below, find (i) Voltage transfer function and (ii) Transfer impedance function. [7+8]

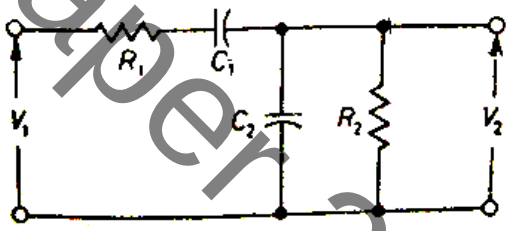

Figure 5

5.a) Define Z, Y and Transmission parameters of a Two-Port network and give their interrelationships between the parameters.

b) Determine h21 of the network shown in figure 6 below. [7+8]

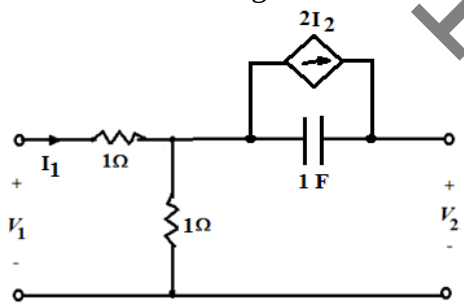

Figure 6

6. Determine the driving point impedance of the network shown in figure 7 below, as seen from terminals 1, 1' given that N_1 and N_2 are identical. Each of the two parts is characterised by $Z_{oc} = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$. [15]

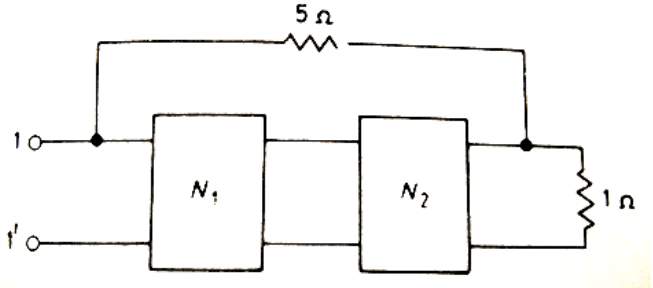

Figure 7

7. Explain the design procedure of constant K - low pass filter. [15]

8.a) Specify the types of symmetry present in the waveform of figure 8 shown below.

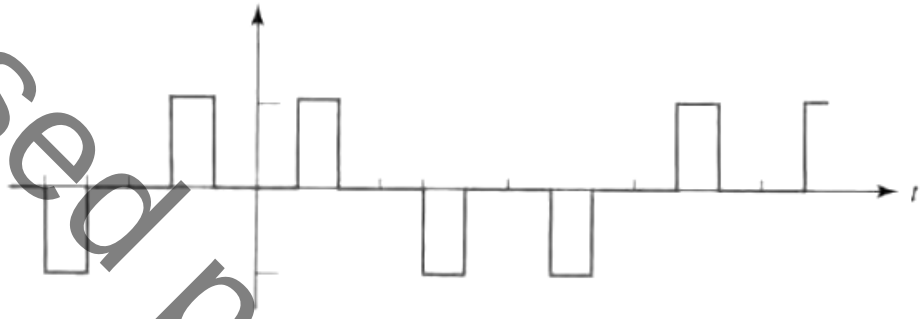

Figure 8

b) A function f(t) has both odd and half-wave symmetry. The period is 8 ms. It is also known that $f(t) = 10^3 t$, $0 < t < 1$ ms, and $f(t) = 0$, $1 < t < 2$ ms. Find values for b_n, $1 \leq n \leq 5$. [7+8]

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