Code No: EE1504 **R14**

I B.Tech. II Semester Regular Examinations, June 2015

NETWORK ANALYSIS

(Electronics & Communication Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.

Answer any **FOUR** questions from **PART-B.**

PART-A

6×2 = 12M

1. Define super node and super mesh.
2. Find the phase angle between
   $i_1 = -4 \text{ Sin } (377t + 25°)$ and $i_2 = 5 \text{ Cos } (377t - 40°)$. Does i_1 lead or lag i_2.
3. What is the condition for resonance in series R-L-C circuit and write expression for Resonant frequency f_n.
4. State and explain Compensation theorem.
5. Derive interrelationship between Y and ABCD parameters.
6. Explain time constant of series R-L circuit in Transient analysis.

PART-B

4×12 = 48M

1. a) In the circuit shown in Fig 1a, calculate the current i, the conductance G and the power P? (4M)

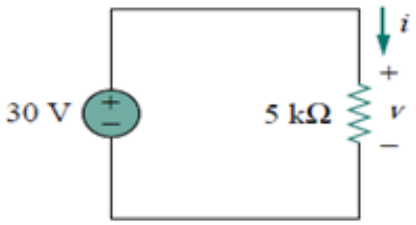

Figure 1a

b) For the circuit shown in Fig 1b, find the node voltages? (8M)

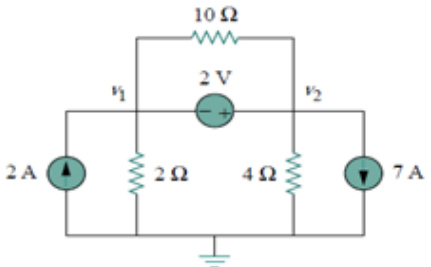

Figure 1b

2. a) Find v(t) and i(t) in the circuit shown in Fig 2a? (6M)

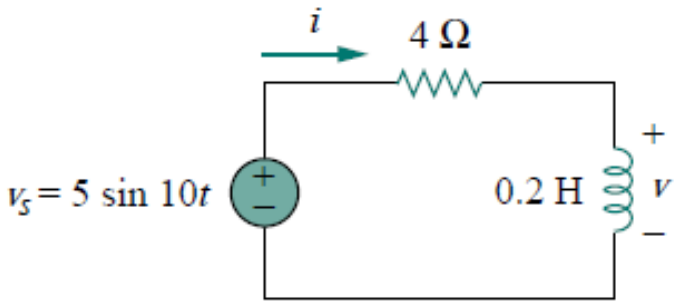

Figure 2a

b) Find the RMS value of the current waveform shown in Figure 2b. If the Current flows through a 9 Ω resistor, calculate the average power absorbed by the resistor? (6M)

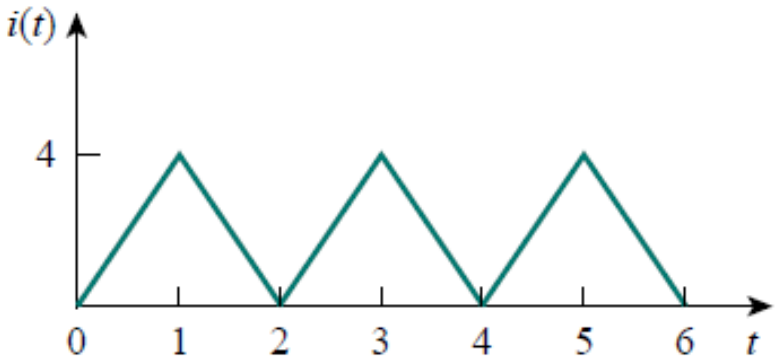

Figure 2b

3. a) Derive the expression for Bandwidth of a series resonant circuit and explain with the help of sketches how bandwidth varies with quality factor. (6M)

b) A series connected circuit has R = 4Ω and L= 25mH

(i) Calculate the value of C that will produce a quality factor of 50.

(ii) Find ω_1, ω_2 and BW

(iii) Determine the average power dissipated at $\omega=\omega_o,\omega_1,\omega_2$. Take V_m=100V (6M)

4. a) State and explain Maximum Power Transfer theorem? (6M)

b) Find the Norton Equivalent circuit for the circuit shown in Figure4? (6M)

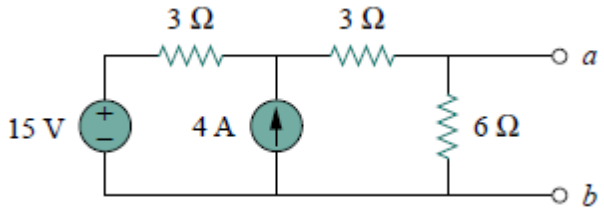

Figure 4.

5. a) Determine the Z parameters of the network shown in figure 5a? (6M)

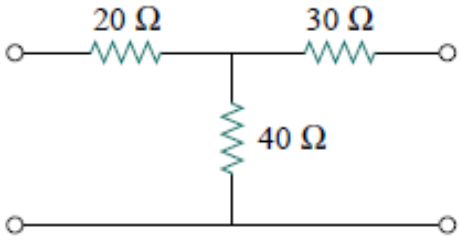

Fig. 5a

b) Find the h-parameters for the two port network shown in fig.5b (6M)

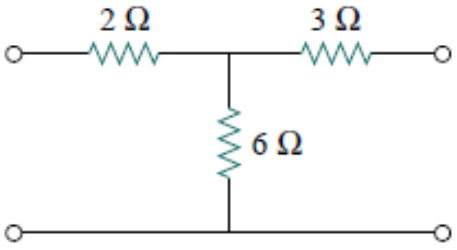

Fig. 5b

6. a) Explain the behaviour of a RL circuit when the input is a step function? (6M)

b) The switch in Fig 6 has been in position A for a long time. At t= 0, the switch moves to B. Determine v(t) for t >0 and calculate its value at t = 1s and 4 s? (6M)

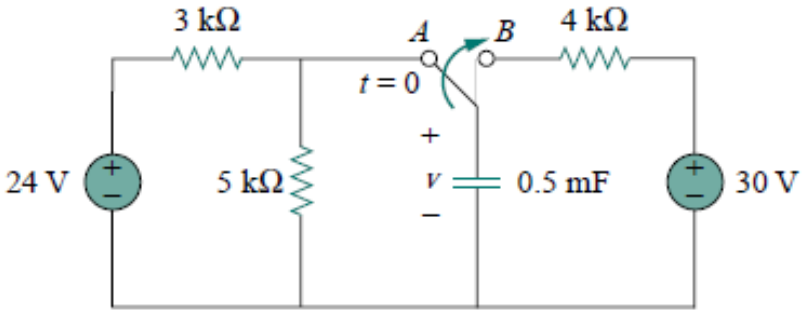

Fig. 6