Code No: R13211 **R13** **SET-1**

I B. Tech II Semester Supplementary Examinations, Nov/Dec - 2017
NETWORK ANALYSIS
(Comm. to ECE, EIE & E COM. E)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **THREE** Questions from **Part-B**

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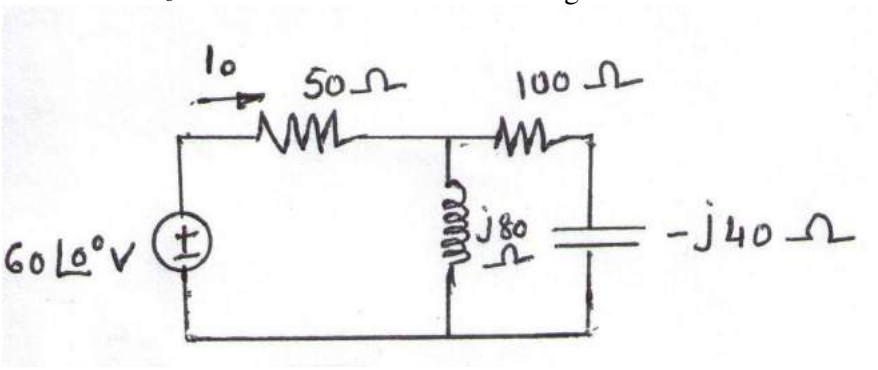
PART –A

1. a) A linear network has a current input 15 Cos $(10t + 30^0)$ A and a voltage output 230 Cos$(10t + 75^0)$ V. Determine the associated Impedance. (3M)

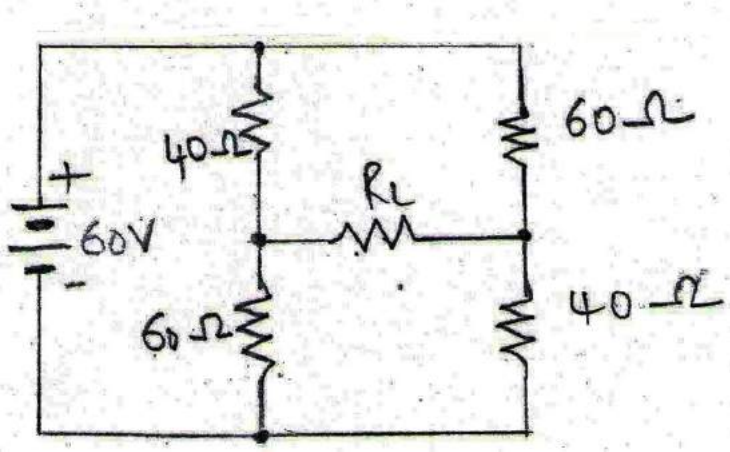
b) Find current I_o in the circuit shown in below Figure. (4M)



c) A series RLC circuit consists of a resistance of 1 k Ω, an inductance of 10 mH and a capacitance of 100 μF. For a supply voltage of 100V, determine the Resonant frequency. (3M)

d) State and explain Superposition theorem with a simple example. (4M)

e) Use Thevenin's theorem to replace the three loop equivalent circuit of below figure by a single loop equivalent circuit in which the identity of R_L is preserved. (4M)



f) The Z parameters of a two-port network are $Z_{11} = 20\ \Omega$, $Z_{22} = 30\ \Omega$, $Z_{12} = Z_{21} = 10\ \Omega$. Find Y parameters. (4M)

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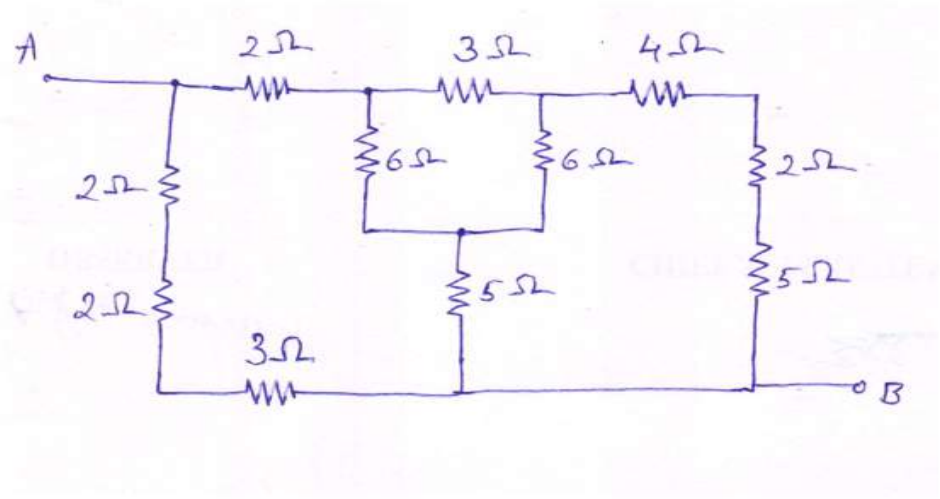
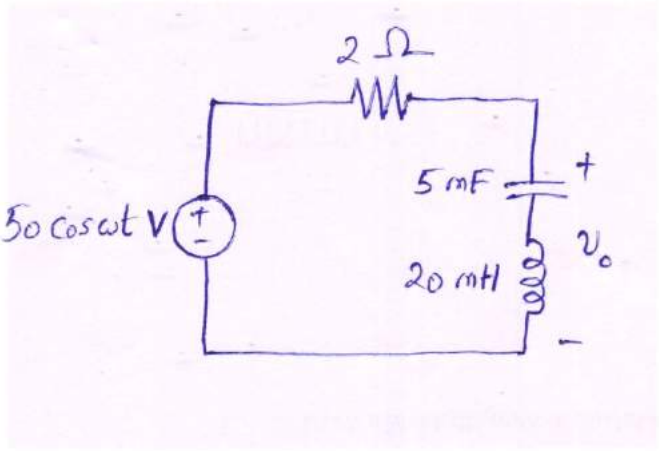
PART –B

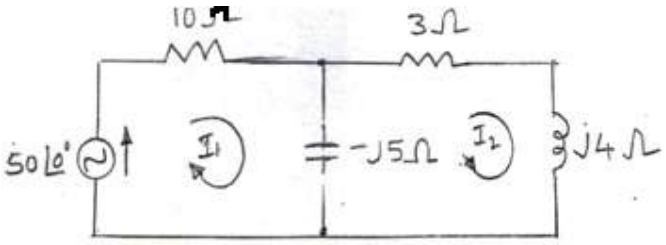
2. a) Calculate the effective resistance between the points A and B in the circuit shown in Fig. (8 M)



b) What value of ω will cause the forced response, V_o, in Fig. to be zero (8 M)



3. a) For the network of Fig. write directly the mesh current equation in matrix notation and hence determine I_1 and I_2 (8M)



b) Show that power consumed by pure inductance and capacitance is zero. (8M)

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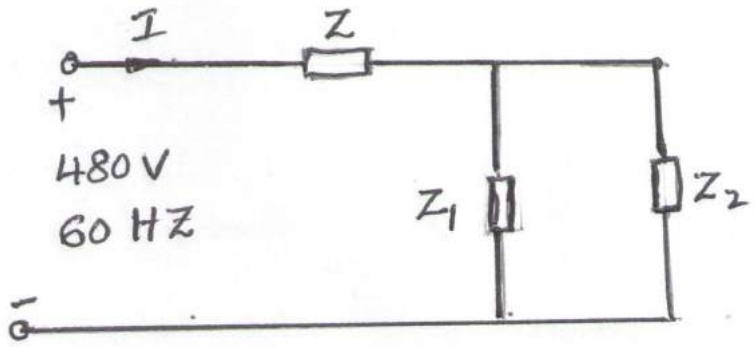
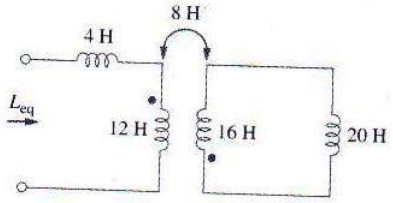
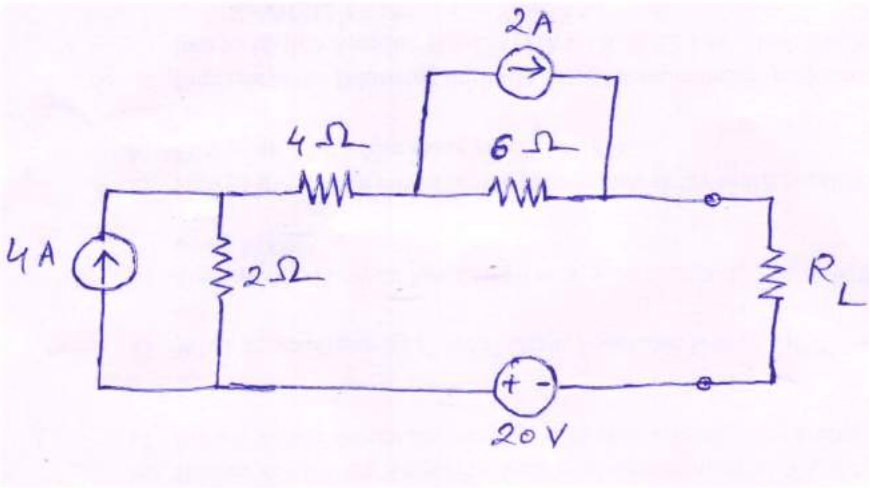
4. a) A 480 V, 60Hz source supplies energy to a parallel circuit consisting of $Z_1 = 25 \angle 30^0\ \Omega$ branch and $Z_2 = 12\angle -40^0\ \Omega$ branch . Find the impedance Z if connected in series with the source that cause the system to be in resonance. (8M)



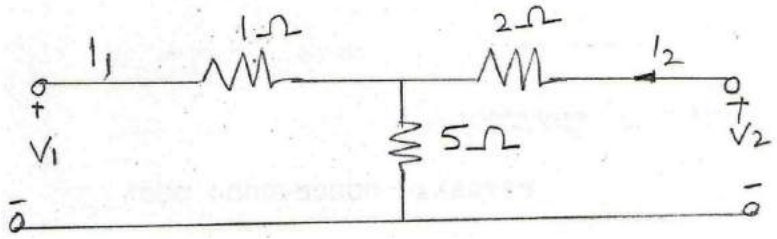
b) Determine the equivalent L_{eq} in the circuit of Figure. (8M)



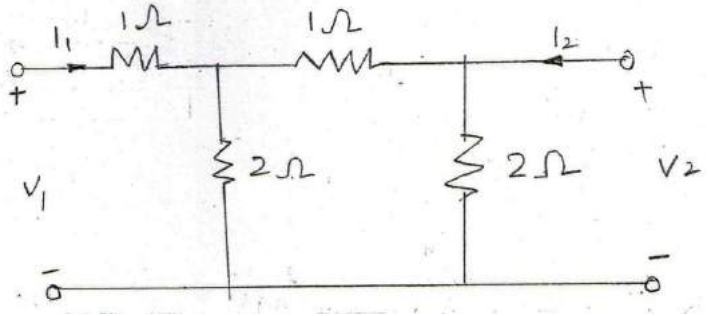
5. a) (i) For the circuit in Fig., obtain the Thevenin equivalent at terminals a-b (16M)
(ii) Calculate the current in $R_L = 8\Omega$
(iii) Find R_L for maximum power deliverable to R_L
(iv) Determine that maximum power



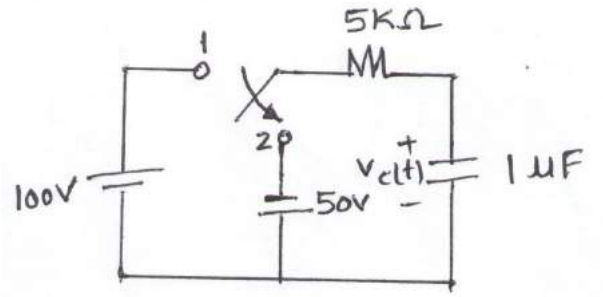
6. a) Find the transmission parameters for the network shown in fig. (8M)



b) Find Z-parameters for the net work shown in Fig (8M)



7. a) The switch in the circuit of fig. is moved from the position 1 to 2 at t = 0. Find Vc (t) (12M)



b) Discuss the behavior of R, L and C elements during transient state and steady state. (4 M)