Code No: R21042 **R10** SET - 1

II B. Tech I Semester Supplementary Examinations, Oct/Nov - 2017
NETWORK ANALYSIS
(Com. to ECE, EIE, ECC)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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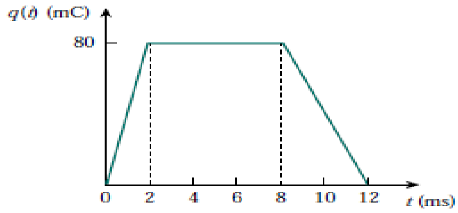
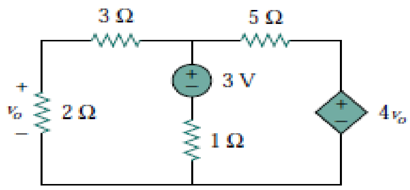
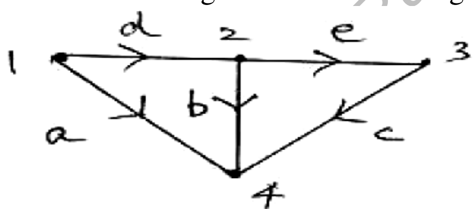
1. a) The charge entering a certain element is shown below Find the current at: (7M)
(i) t = 1 ms (ii) t = 6 ms (iii) t = 10 ms



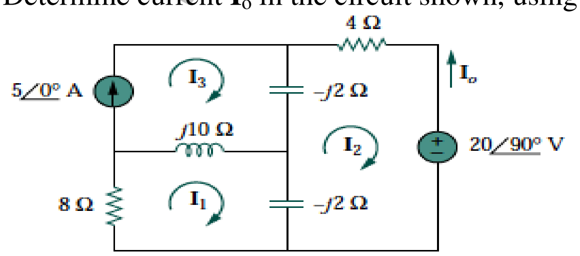
b) Using nodal analysis, find v_o in the circuit shown below? (8M)



2. a) Define Graph, Tree, Basic tie set matrix and cut set matrix for a planar network with an example? (8M)
b) For the graph shown, write the cut set schedule and obtain the relation between tree branch voltages and branch voltages. (7M)



3. Determine current I_o in the circuit shown, using mesh analysis. (15M)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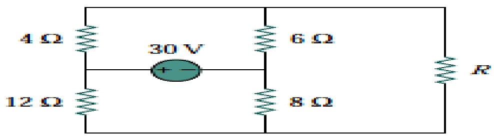
4\. a) A coil of inductance 0.20 H and resistance 60 Ω is connected in parallel with a 20 μF capacitor across a 20 V, variable frequency supply. Calculate (a) the resonant frequency, (b) the dynamic resistance, (c) the current at resonance and (d) the circuit Q-factor at resonance. (8M)

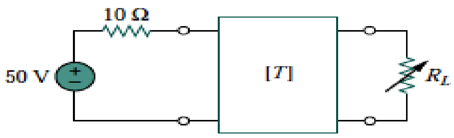
b) Define the following terms with an example (7M)
(i) self inductance
(ii) Mutual inductance
(iii) Coefficient of coupling

5\. a) State and explain maximum power transfer theorem with an example? (7M)

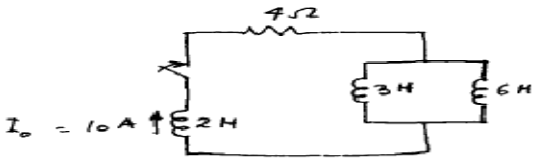
b) Find the maximum power that can be delivered to the resistor R in the circuit shown below. (8M)



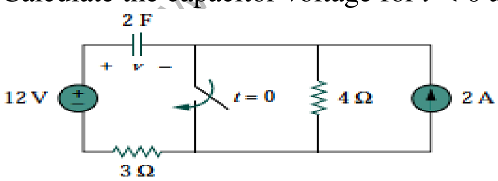
6\. The **ABCD** parameters of the two-port network in fig are $\begin{bmatrix} 4 & 20\Omega \\ 0.1S & 2 \end{bmatrix}$.The output port is connected to a variable load for maximum power transfer. Find R_L and the maximum power transferred. (15M)



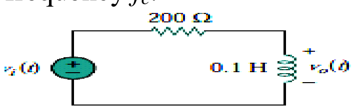
7\. a) In the circuit shown below, switch is closed at t=0, when the 2H inductor has a initial current of 10A.Find the voltage across the resistance. (7M)



b) Calculate the capacitor voltage for $t < 0$ and $t > 0$ for the circuit shown. (8M)



8\. a) Determine what type of filter is in Fig. shown below. Calculate the corner frequency f_c. (8M)



b) Obtain the transfer function of a high pass filter with a pass band gain of 10 and a cut-off frequency of 50 rad/s. (7M)