

Code No: R21042

R10
SET - 1
II B. Tech I Semester Supplementary Examinations, Oct/Nov - 2017
NETWORK ANALYSIS

(Com. to ECE, EIE, ECC)

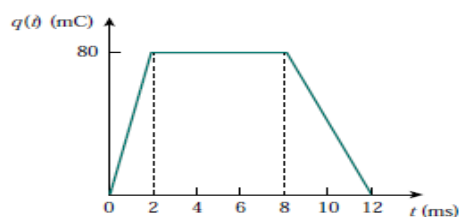
Time: 3 hours

Max. Marks: 75

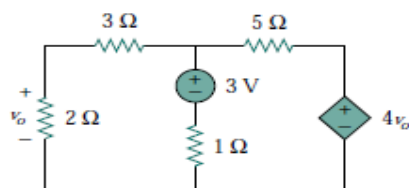
 Answer any **FIVE** Questions

 All Questions carry **Equal** Marks

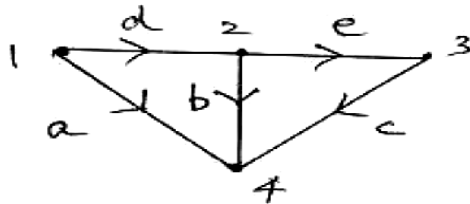
1. a) The charge entering a certain element is shown below Find the current at: (7M)
- (i) $t = 1$ ms (ii) $t = 6$ ms (iii) $t = 10$ ms



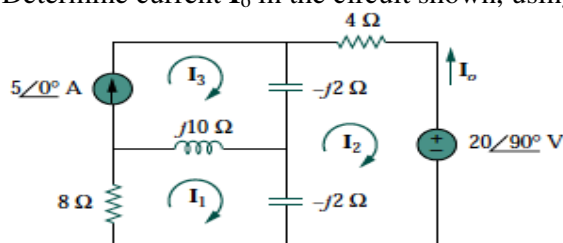
- b) Using nodal analysis, find v_o in the circuit shown below? (8M)



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)



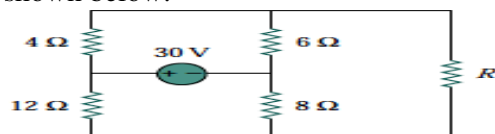
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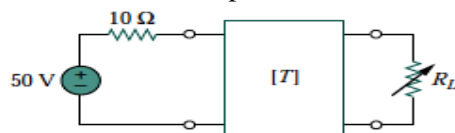
SET - 1

4. a) A coil of inductance 0.20 H and resistance 60Ω is connected in parallel with a $20 \mu\text{F}$ 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)
- self inductance
 - Mutual inductance
 - Coefficient of coupling

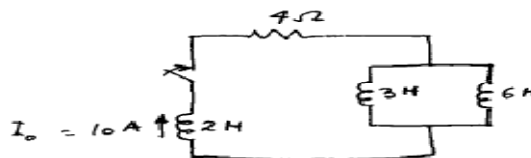
5. a) State and explain maximum power transfer theorem with an example? (7M)
- b) Find the maximum power that can be delivered to the resistor R in the circuit shown below. (8M)



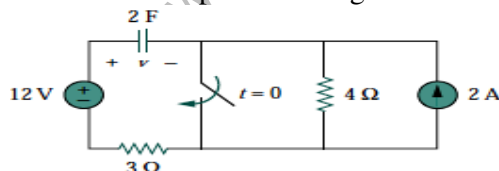
6. The **ABCD** parameters of the two-port network in fig are $\begin{bmatrix} 4 & 20\Omega \\ 0.1\text{S} & 2 \end{bmatrix}$. The output port is connected to a variable load for maximum power transfer. Find R_L and the maximum power transferred. (15M)



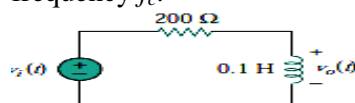
7. a) In the circuit shown below, switch is closed at $t=0$, when the 2H inductor has a initial current of 10A . Find the voltage across the resistance. (7M)



- 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)