Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EC201

Course Name: NETWORK THEORY

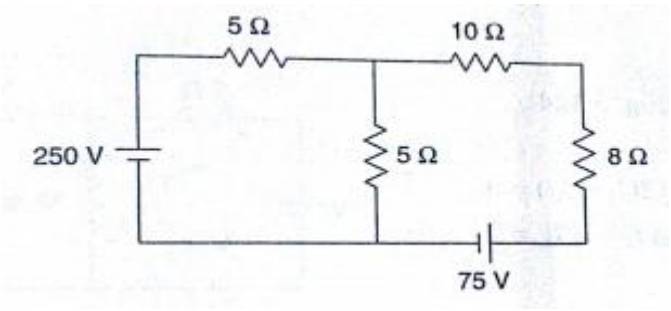
Max. Marks: 100 Duration: 3 Hours

PART A

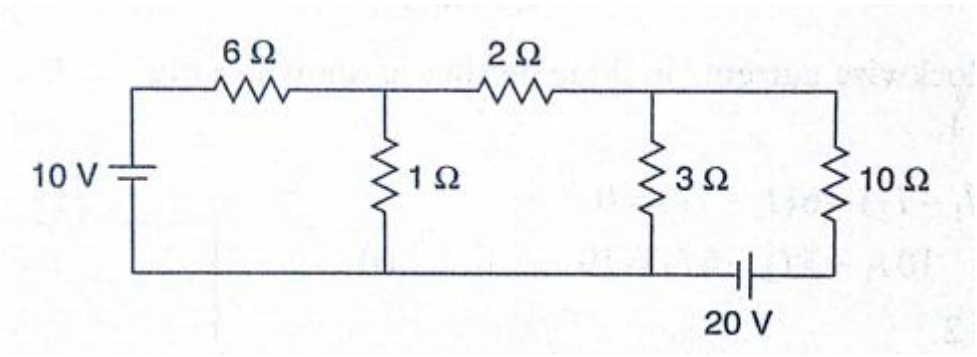
Answer any two full questions, each carries 15 marks. Marks

1 a) State and prove initial value theorem and final value theorem (8)

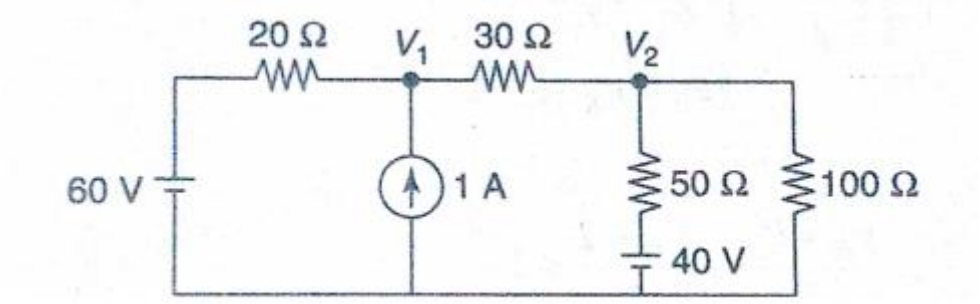
b) Find the current through 8 Ω resistor in the network using Thevenin's theorem (7)



2 a) Find the current through 2 Ω resistor using Mesh analysis (8)



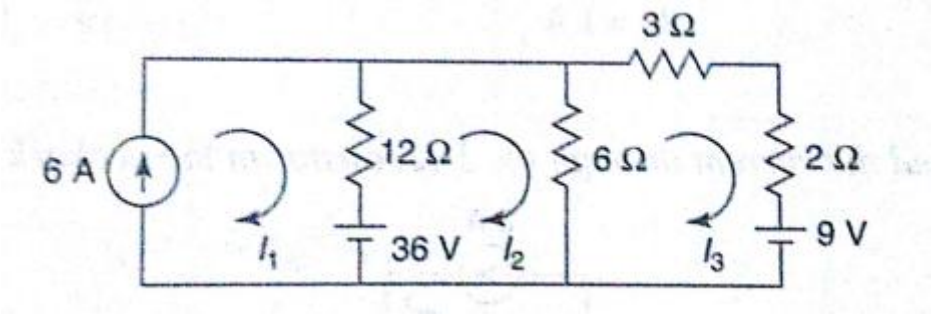
b) Find the current in the 100 Ω resistor using Nodal analysis (7)



3 a) State and prove maximum power transfer theorem when the load impedance is a (8)

complex impedance with variable resistance and variable reactance

b) Find the current through the 2 Ω resistor (7)



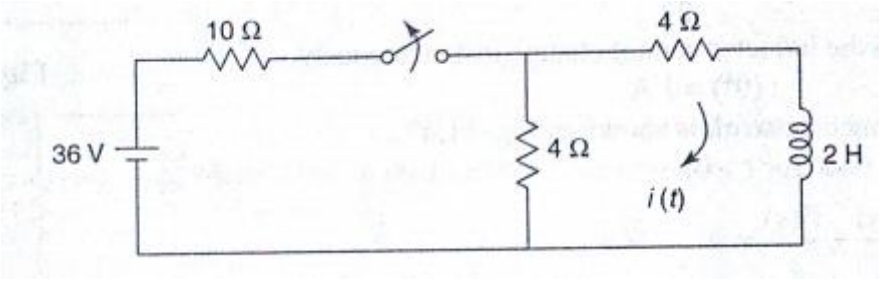
PART B

Answer any two full questions, each carries 15 marks.

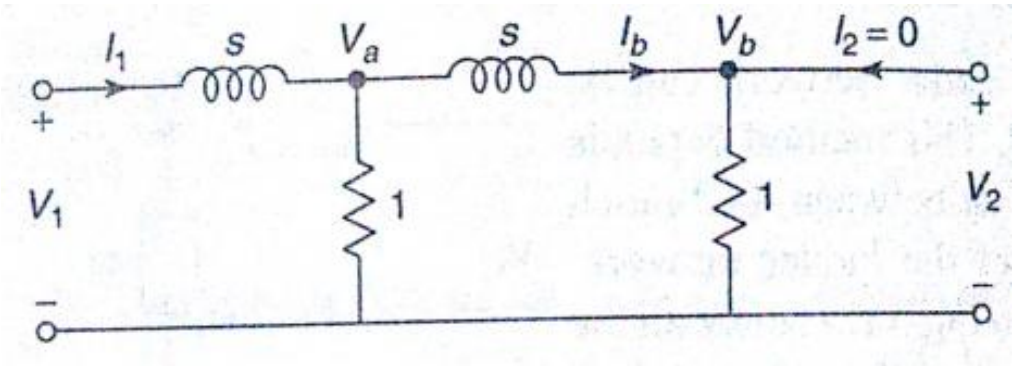
4 a) Solve $\frac{dy}{dt} + 2y = e^{-3t}$, $y(0) = 1$ (8)

b) The network shown has acquired steady state with the switch closed for t < 0. (7)

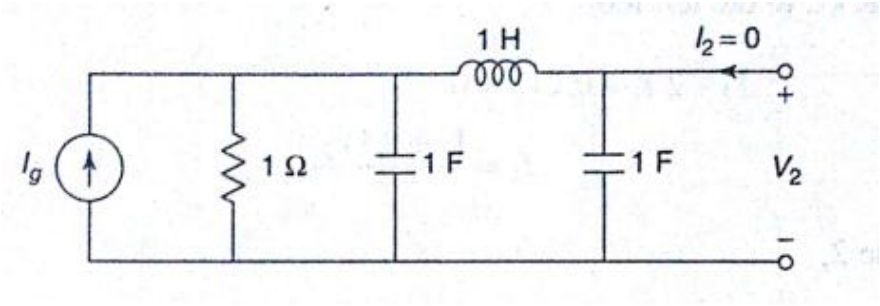
At t = 0, the switch is opened. Obtain i(t) for t >0.



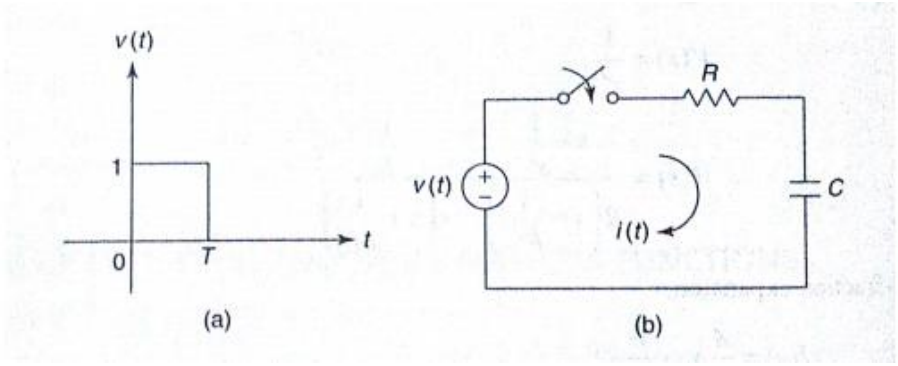
5 a) For the network determine the voltage transfer function V_2/V_1 (7)



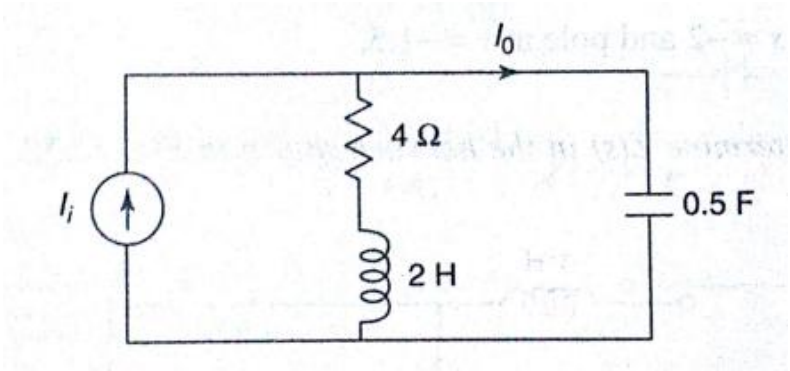
b) For the network shown determine V_2/I_g. Plot the pole zero diagram of V_2/I_g. (8)



6 a) A rectangular voltage pulse of unit height and T second duration is applied to a series RC network at t=0. Obtain the expression for curret i(t). Assume the capacitor to be initially uncharged. (7)



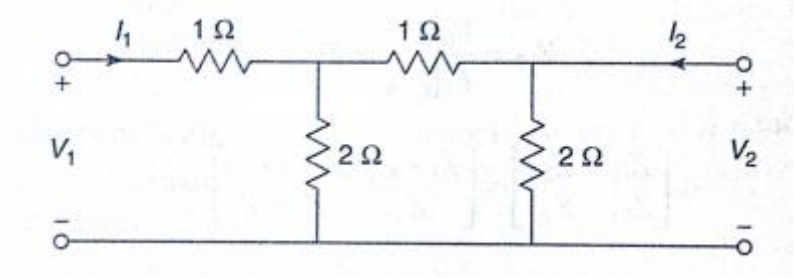
b) For the network shown plot poles and zeros of function I_0/ I_i (8)



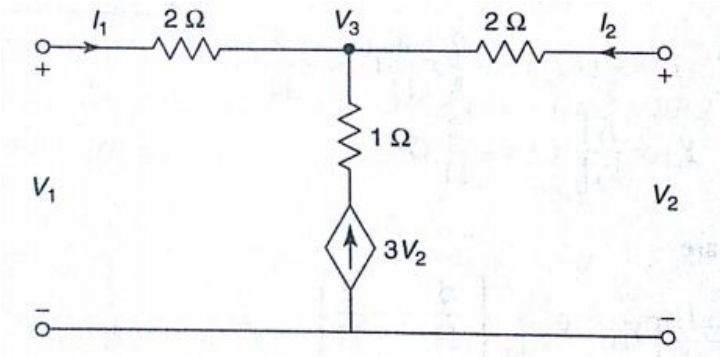
PART C

Answer any two full questions, each carries 20 marks.

7 a) Find Z parameters for the network shown (10)



b) Find the Y parameters of the network shown (10)



8 a) Derive the resonance frequency for a series RLC circuit and give its power factor, current and voltage at resonance (10)

b) A series RLC circuit has a quality factor of 5 at 50 rad/s. The current flowing through the circuit at resonance is 10 A and the supply voltage is 100 V. Find the circuit constants R,L and C (10)

9 a) Compare series and parallel resonant circuits (current, impedance, power factor, resonant frequency and Q factor) (10)

b) A coil of 10 Ω resistance and 2 H inductance is connected in parallel with a variable capacitor across a 220 V, 50 Hz supply. Calculate (a) the capacitance of the capacitor for the resonance, (b)the dynamic impedance of the circuit and (c) supply current (10)

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