

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

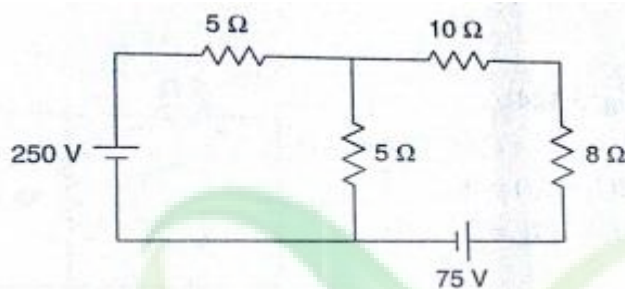
Duration: 3 Hours

PART A

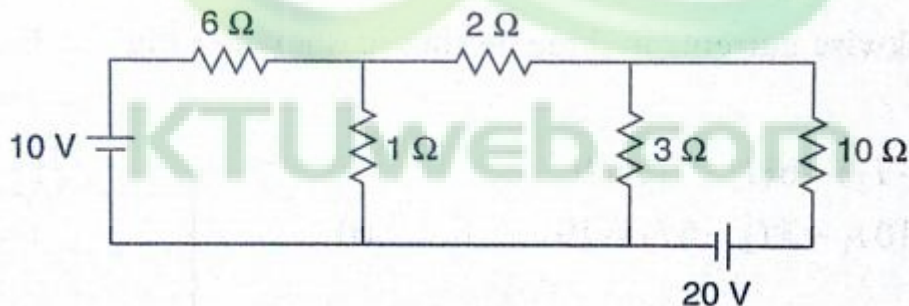
Answer any two full questions, each carries 15 marks.

Marks

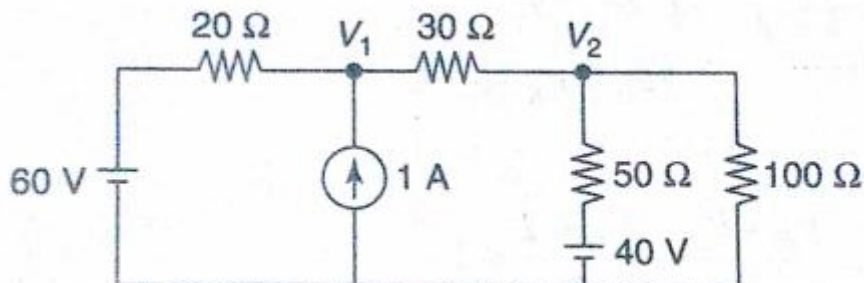
- 1 a) State and prove initial value theorem and final value theorem (8)
 b) Find the current through $8\ \Omega$ resistor in the network using Thevenin's theorem (7)



- 2 a) Find the current through $2\ \Omega$ resistor using Mesh analysis (8)



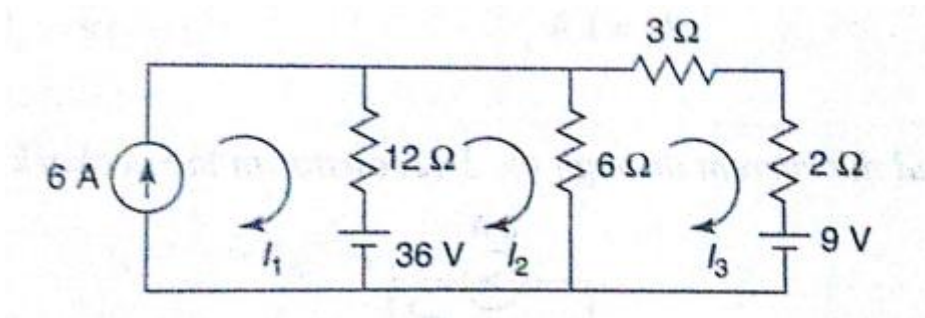
- b) Find the current in the $100\ \Omega$ resistor using Nodal analysis (7)



- 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)

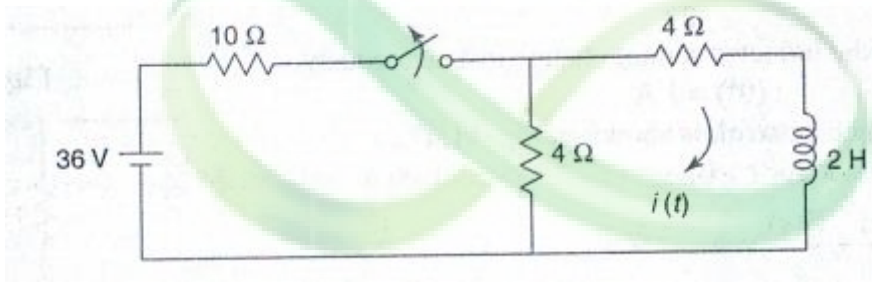


PART B

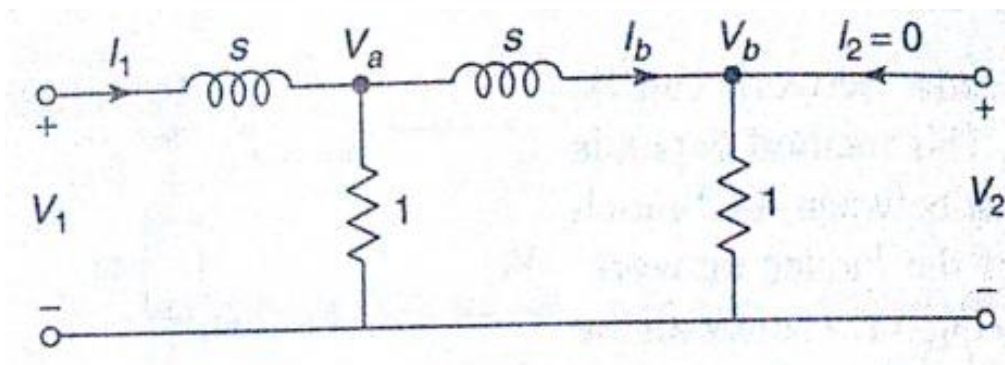
Answer any two full questions, each carries 15 marks.

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

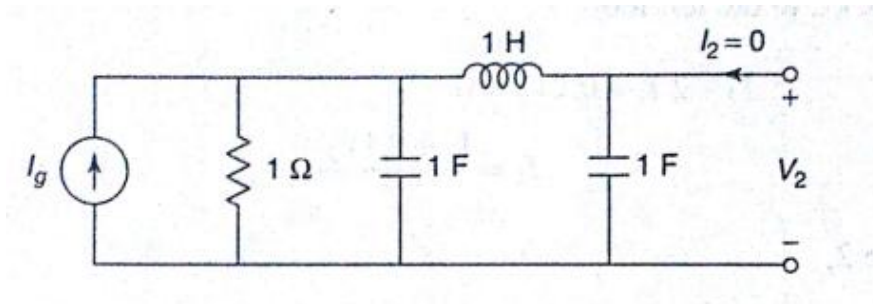
- b) The network shown has acquired steady state with the switch closed for $t < 0$. At $t = 0$, the switch is opened. Obtain $i(t)$ for $t > 0$. (7)



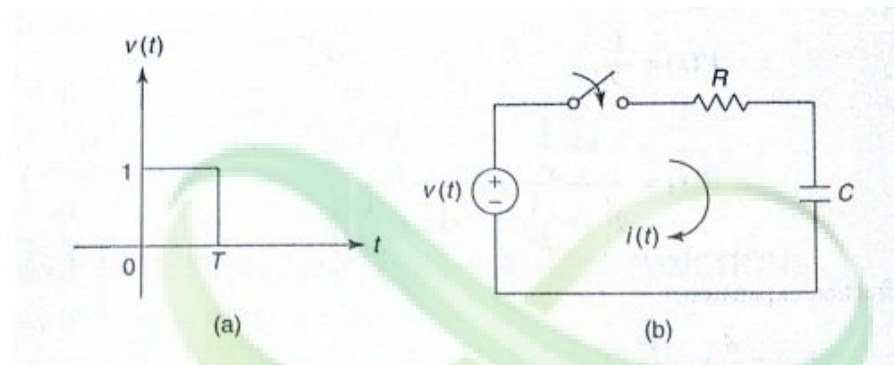
- 5 a) For the network determine the voltage transfer function V_2/V_1 (7)



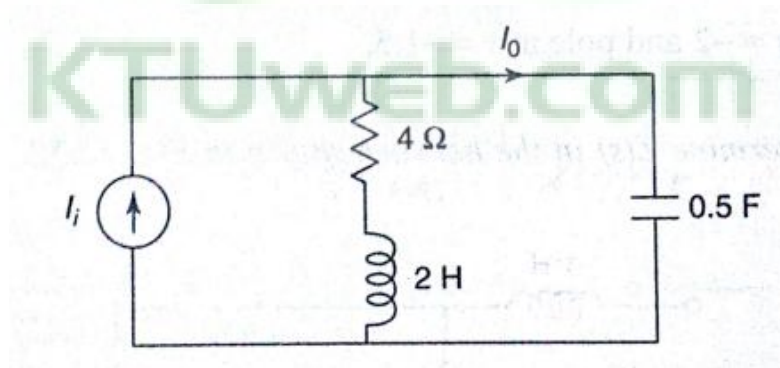
- b) For the network shown determine V_2/I_g . Plot the pole zero diagram of V_2/I_g . (8)



- 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 current $i(t)$. Assume the capacitor to be initially uncharged. (7)



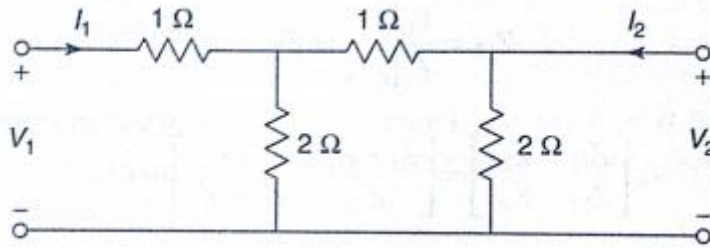
- b) For the network shown plot poles and zeros of function I_0/I_i (8)



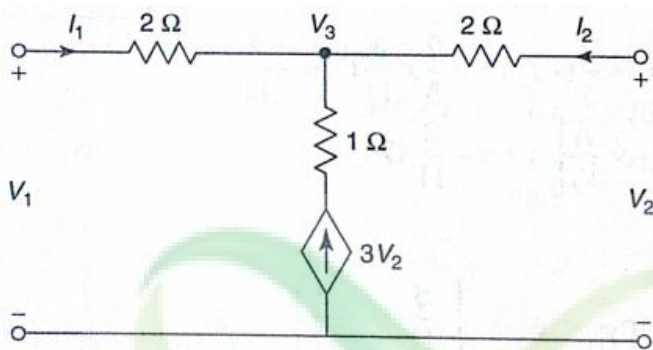
PART C

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)
