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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: EC201

Course Name: NETWORK THEORY (EC, AE)

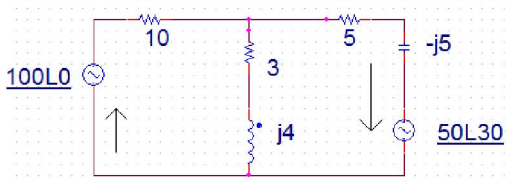
Max. Marks: 100 Duration: 3 Hours

PART A

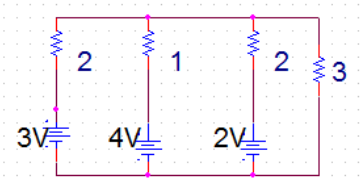
Answer any two full questions, each carries 15 marks. Marks

1 a) State and prove final value theorem and initial value theorems. (7)

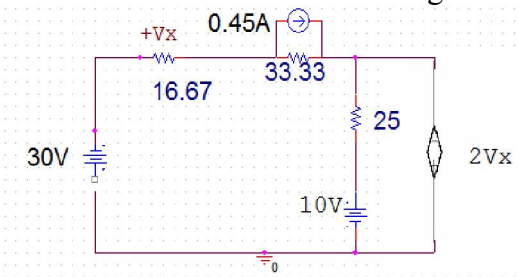
b) Find the current in each resistor using the superposition theorem. (8)



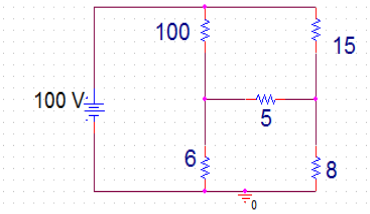
2 a) For the circuit shown in figure, find the current through 3 Ω using Millmann's theorem (5)



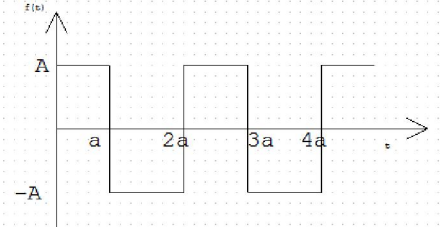
b) Use mesh analysis to find Vx in the circuit shown in figure (10)



3 a) Use Thevenin's theorem to find the current through 5Ω resistor (10)



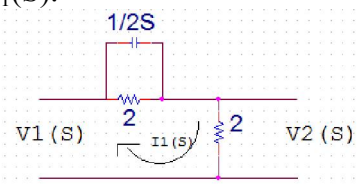
b) Find the Laplace transform of the square wave shown in figure (5)



PART B

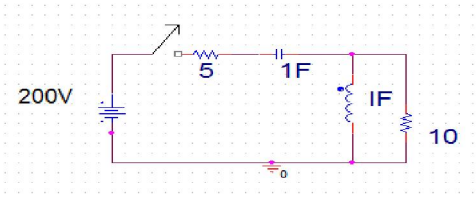
Answer any two full questions, each carries 15 marks.

4 a) For the network shown in fig obtain the transfer functions $G_{21}(S)$, $Z_{21}(S)$ and driving point impedance $Z_{11}(S)$. (10)



b) Determine the transform impedance and admittance across capacitor (5)

5 a) For the circuit shown in figure , the switch was closed at time t=0, find the drop across 10Ω (8)



b) Derive the response of a series RLC circuit with step input. (7)

6 a) For the given network function, draw the pole zero diagram and hence obtain the time domain response i(t). (10)

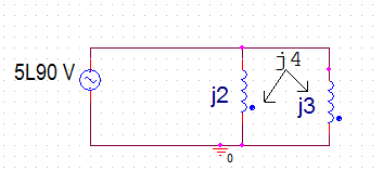
$$I(S) = \frac{5s}{(s+1)(s^2+4s+8)}$$

b) Find the inverse Laplace transform of $F(s)= \frac{15s^2-15s-11}{(s+1)(s-2)^3}$ (5)

PART C

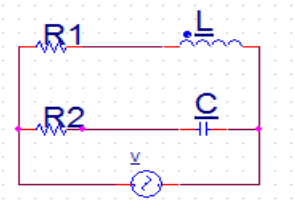
Answer any two full questions, each carries 20 marks.

7 a) For the circuit shown below find the input impedance and also find the loop currents. (8)

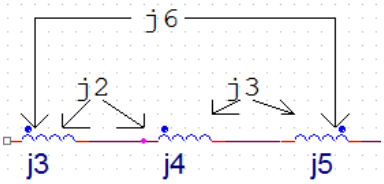


b) Define the terms Characteristic impedance, Image impedance and propagation constant (5)

c) Find the expression for resonant frequency for the circuit shown below. (7)

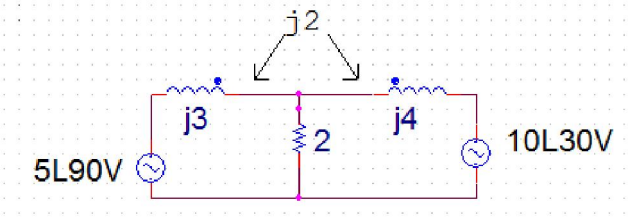


8 a) For the circuit shown below determine the equivalent reactance (5)



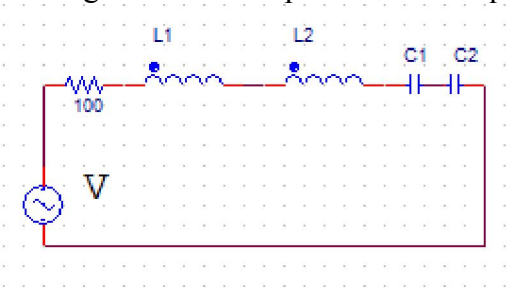
b) Prove that AD-BC=1 for a two port bilateral network (7)

c) For the circuit shown in figure find the drop across the two inductor coils. (8)



9 a) A capacitor of 30μF and a resistance of 40Ω are connected in series with a coil having resistance 5 and inductance L. The circuit resonates at 1.5Khz frequency. Find the value of L. Also find the current at resonance, Q factor, half power frequencies and bandwidth. (10)

b) For the circuit shown in figure find the expression for frequency at resonance. (10)



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