

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)

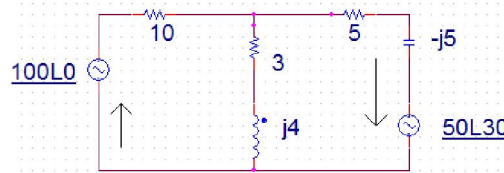
Max. Marks: 100

Duration: 3 Hours

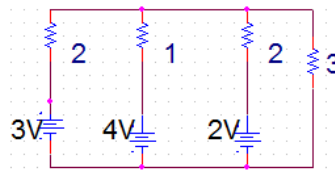
PART A

Answer any two full questions, each carries 15 marks.

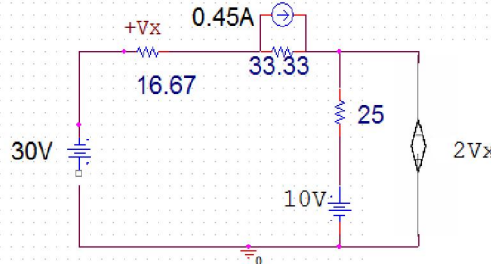
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| 1 | a) State and prove final value theorem and initial value theorems. | Marks
(7) |
| | b) Find the current in each resistor using the superposition theorem. | (8) |



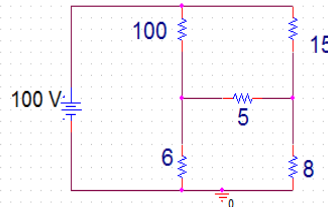
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| 2 | a) For the circuit shown in figure, find the current through 3 Ω using Millmann's theorem | (5) |
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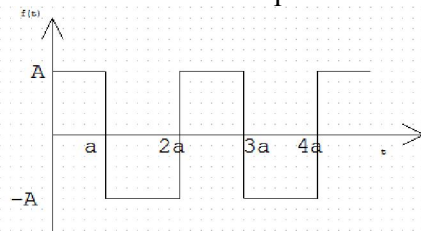
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| b) | Use mesh analysis to find V_x in the circuit shown in figure | (10) |
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| 3 | a) Use Thevenin's theorem to find the current through 5Ω resistor | (10) |
|---|---|------|



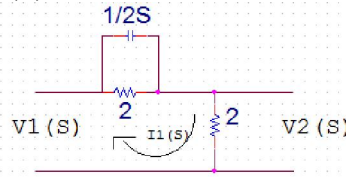
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| b) | Find the Laplace transform of the square wave shown in figure | (5) |
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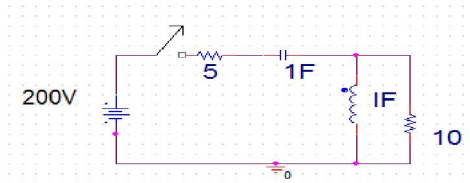
PART B

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)

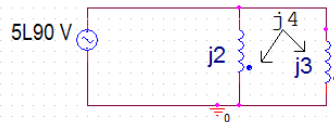
$$I(S) = \frac{5s}{(s+1)(s^2+4s+8)}$$

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

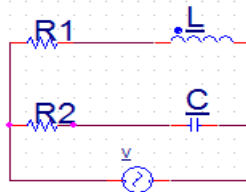
PART C

Answer any two full questions, each carries 20 marks.

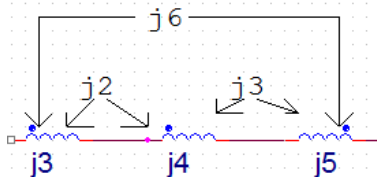
- 7 a) For the circuit shown below find the input impedance and also find the loop currents. (8)



- 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)

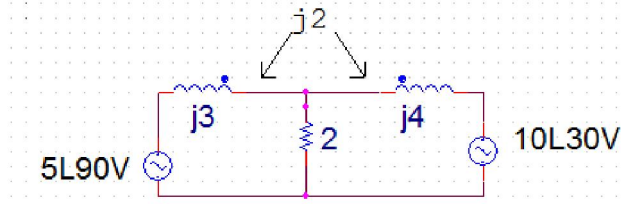


- b) Prove that $AD-BC=1$ for a two port bilateral network (7)

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



- 9 a) A capacitor of $30\mu F$ and a resistance of 40Ω are connected in series with a coil (10)
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.
- b) For the circuit shown in figure find the expression for frequency at resonance. (10)

