Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: EC201

Course Name: NETWORK THEORY (EC, AE)

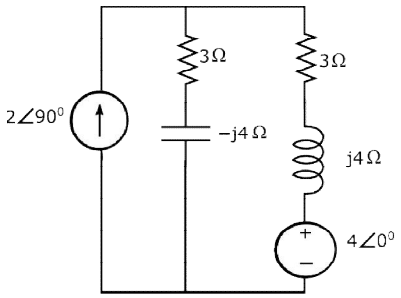
Max. Marks: 100 Duration: 3 Hours

PART A

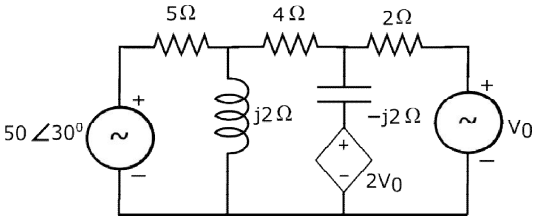
Answer any two full questions, each carries 15 marks Marks

1 a) State Thevenin's Theorem & Reciprocity Theorem. (4)

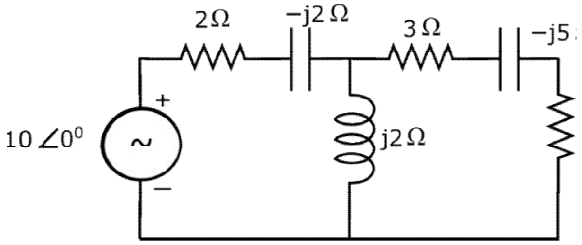
b) Using Superposition Theorem, find the value of current through the capacitor. (4)



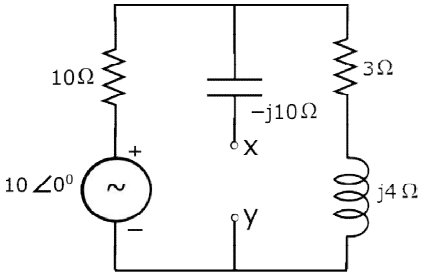
c) Find the value of V_0 such that no current flows through 4Ω resistor. (7)



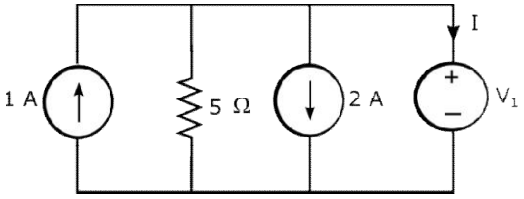
2 a) Find the voltage across inductor. Also find the power dissipated across 2Ω resistor. (8)



b) Obtain Thevenin equivalent circuit across x-y. Then obtain Norton equivalent circuit. (7)



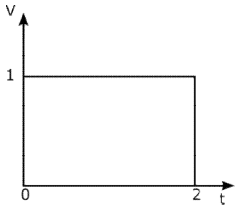
3 a) The power supplied by 1A source is 10W. Find V_1 and I. (6)



b) Find Laplace transform of the following: (9)

i) $sin(5t).cos(2t)$ ii) $te^{-2t}\cos(t)$

iii)



PART B

Answer any two full questions, each carries 15 marks

4 a) Solve the differential equation using Laplace Transform, given y(0) = 1 and $y'(0) = 0$. (8)

$$y'' - y' - 2y = t$$

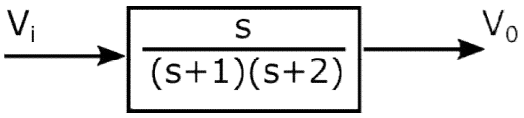
b) The current I(s) of a network is (7)

$$I(s) = \frac{10s}{(s+1)(s+3)}$$

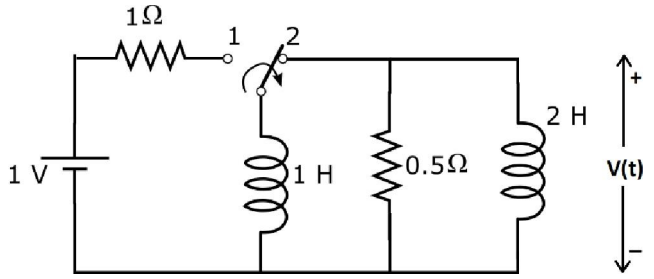
Plot its pole-zero plot and hence obtain i(t) from the pole-zero plot.

5 a) Write any five properties of driving point immittance functions. (5)

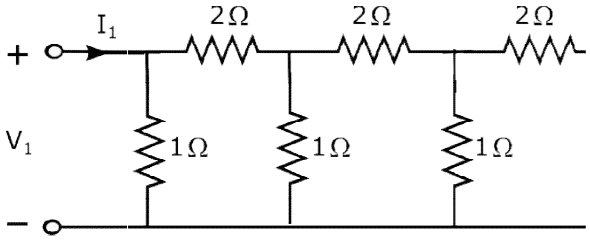
b) Find the steady state output voltage $V_0(t)$, given the input voltage (3)
$V_i(t) = 10\cos(2t + 40^0)$ V



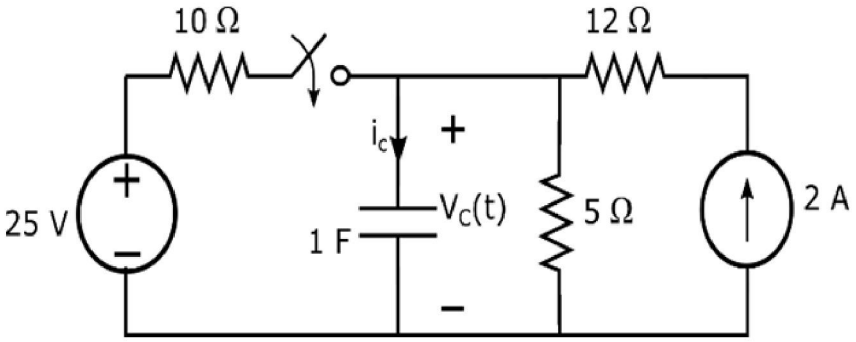
c) The switch is in position 1 for a long time. At t = 0, it is moved to position 2. Find v(t) for $t \geq 0$. (7)



6 a) FindI_2/I_1 and $Z_{11}$for the below network. (7)



b) The switch is opened for a long time. The switch is closed for t ≥ 0. Find the expression of capacitor voltage $V_c(t)$ for t ≥ 0. Then determine capacitor current i_c. (8)



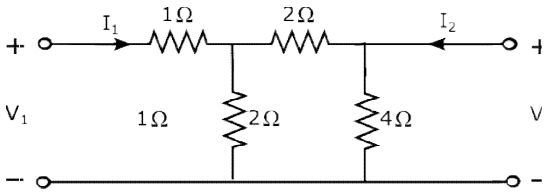
PART C

Answer any two full questions, each carries 20 marks

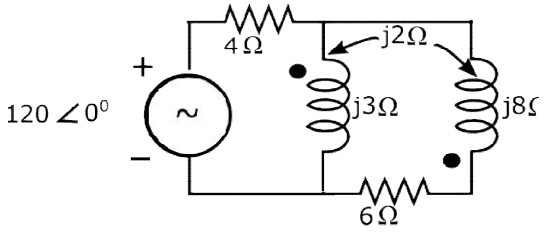
7 a) Differentiate between self-inductance and mutual inductance. (2)

b) Give the expressions of quality factor of series and parallel RLC networks. (3)

c) Find the ABCD parameters of the network shown. (7)



d) Find the current through 6Ω resistor using mesh analysis. (8)



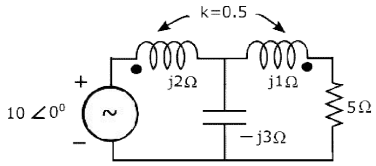
8 a) Explain the term selectivity. (2)

b) Draw the series and parallel connection of two port network and derive the parameter matrices for the resultant network. (8)

c) Draw the circuit of a single tuned circuit and derive an expression for output voltage. (10)

9 a) Explain the following termsand write the relation between them: (4)
i) Bandwidth ii) Q factor.

b) Find the drop across 5 Ω resistor. (6)



c) Currents I_1 and I_2 entering at port 1 and port 2 respectively of a two-port network are given by (10)

$$I_1 = 0.5V_1 - 0.2V_2$$
$$I_2 = -0.2V_1 + V_2$$

Find Y, Z and ABCD parameters. From Y parameters, check whether the network is reciprocal and symmetrical.

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