

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Electric circuit analysis

Semester: III

Program: B.tech. Electrical

Time 03 hrs.

Course Code: EPEG 2009

Max. Marks: 100

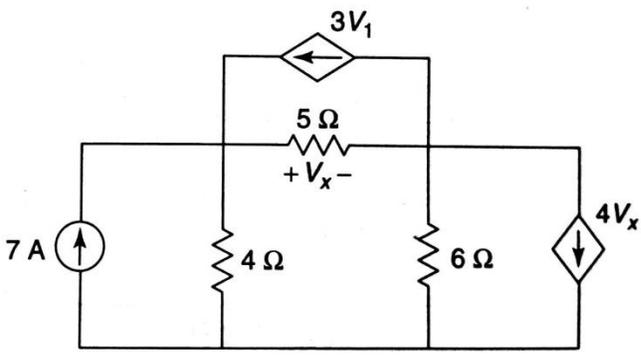
No. of pages - 3

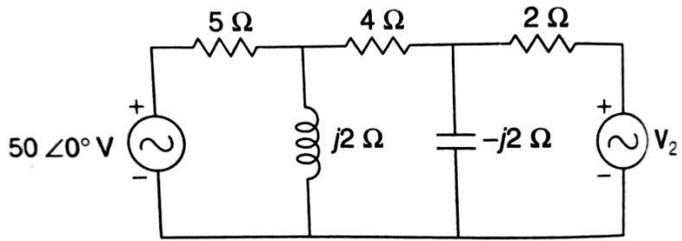
Instructions: All questions are compulsory

SECTION A

S. No.		Marks	CO
Q.1	<p>An impedance function has the pole zero pattern shown in figure. What are the elements it composed?</p>	5	CO3
Q.2	<p>In the circuit shown in figure, the power consumed in the resistance R is measured when one source is acting at a time, these values are 18 W, 50 W and 98 W. When all the sources are acting simultaneously, what would be the maximum and minimum values of power in R.</p>	5	CO1
Q.3	<p>A source of angular frequency of 1 rad/s has a source impedance consisting of a 1Ω resistance in series with a 1H inductance. Find out the load, which will obtain maximum power transfer.</p>	5	CO2
Q.4	<p>The current $i(t)$ through a 10 ohm resistor in series with an inductance is given by $i(t) = 3 + 4 \sin (100t + 45^\circ) + 4 \sin (300t + 60^\circ)$ Amperes. Find the RMS value of the current and the power dissipated in the circuit.</p>	5	CO1

SECTION B

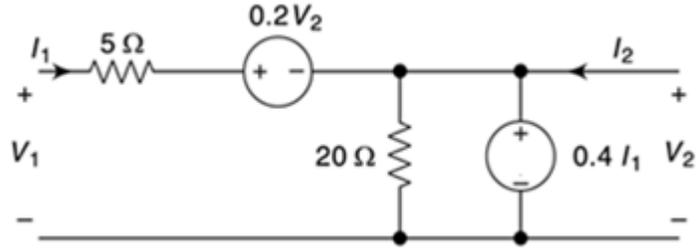
Q.5	<p>Find the voltage V_x in the network shown in figure.</p> 	10	CO2
-----	-------------------------------------------------------------------------------------------------------------------------------------------------------------	----	-----

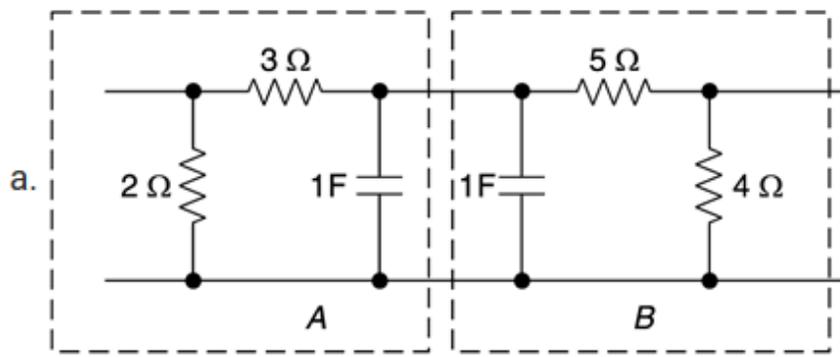
Q.6	<p>In the network of figure, find V_2 which results in zero current through the 4Ω resistor.</p> 	10	CO3
-----	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----	-----

Q.7	<p>Realize the given function in FOSTER I form:</p> $Y(s) = \frac{(s + 2)(s + 5)}{s(s + 4)(s + 6)}$	10	CO5
-----	-----------------------------------------------------------------------------------------------------	----	-----

Q.8	<p>For the given denominator polynomial of a network function, verify the stability of the network using Routh criteria. $P(s) = s^5 + 12s^4 + 45s^3 + 60s^2 + 44s + 48$.</p>	10	CO5
-----	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----	-----

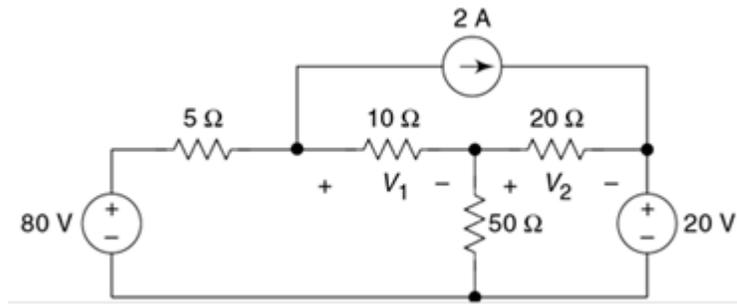
SECTION-C

Q.91	<p>Find the Y-parameter for the network shown in figure.</p>  <p style="text-align: center;">OR</p> <p>Calculate the ABCD parameters for the block A and B separately and then using these results, calculate the ABCD parameters of the whole circuit shown in the figure. Prove any formula used.</p>		CO4
------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	-----



Q.10

For the circuit shown in the figure construct a tree in which 10 ohm and 20ohm are in tree branches. Using graph theory, solve for V_1 and V_2 .



20

CO3