



Example Exam - Basic Electricity, 08/10/2018

Name:

Student ID:

0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

In the following circuit, where source voltage is $V_s = 110$ V, current and active power measurements were taken:

- $I_2 = 2$ A;
- $I_3 = 4$ A;
- $P_3 = 300$ W (measured in RL branch)

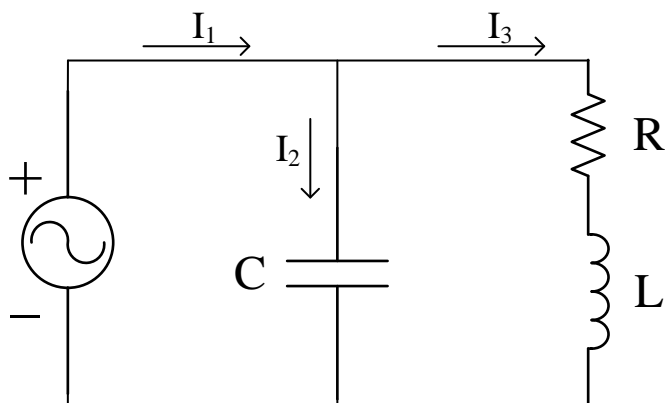


Figura 1: Circuit



Question 1 Find the magnitude for current I_1 , in amperes.

<input type="checkbox"/>	0	0	0
1	1	1	1
2	<input type="checkbox"/>	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	<input type="checkbox"/>	<input type="checkbox"/>
9	9	9	9

Question 2 Find the power factor in the RL branch (leading or lagging).

<input type="checkbox"/>	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	<input type="checkbox"/>	6
7	7	7
8	8	<input type="checkbox"/>
9	9	9

Question 3 Find the power factor as seen from the voltage source (leading or lagging).

<input type="checkbox"/>	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	<input type="checkbox"/>
6	6	6
7	7	7
8	8	8
9	9	9



Question 4 Describe the procedure and assumptions that should be followed to find the capacitor that adjusts the power factor to a specific value.

0	0.5	1	1.5	2	2.5	
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0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

In the following circuit, where source voltage is $V_s = 110$ V, current and active power measurements were taken:

- $I_2 = 2$ A;
- $I_3 = 4$ A;
- $P_3 = 300$ W (measured in RL branch)

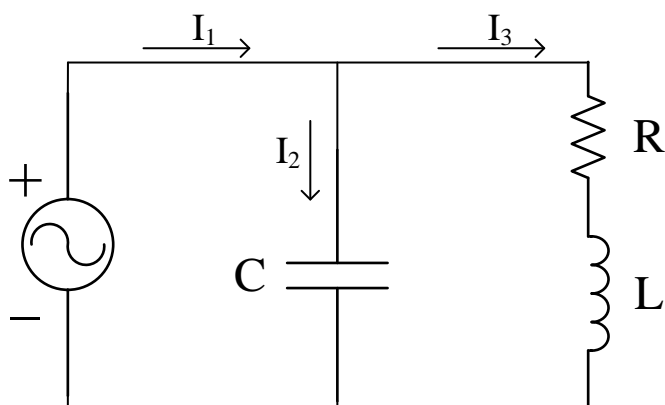


Figura 2: Circuit



Question 1 Find the magnitude for current I_1 , in amperes.

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text"/>	<input type="text"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>

Question 2 Find the power factor in the RL branch (leading or lagging).

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>

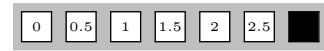
Question 3 Find the reactive power supplied by the voltage source, in VAR.

<input type="text" value="0"/>	<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="1"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text"/>	<input type="text" value="8"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text"/>	<input type="text" value="9"/>



+2/3/54+

Question 4 Describe the procedure and assumptions that should be followed to find the capacitor that adjusts the power factor to a specific value.





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Name:

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0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

In the following circuit, where source voltage is $V_s = 127$ V, current and active power measurements were taken:

- $I_2 = 1$ A;
- $I_3 = 3$ A;
- $P_3 = 280$ W (measured in RL branch)

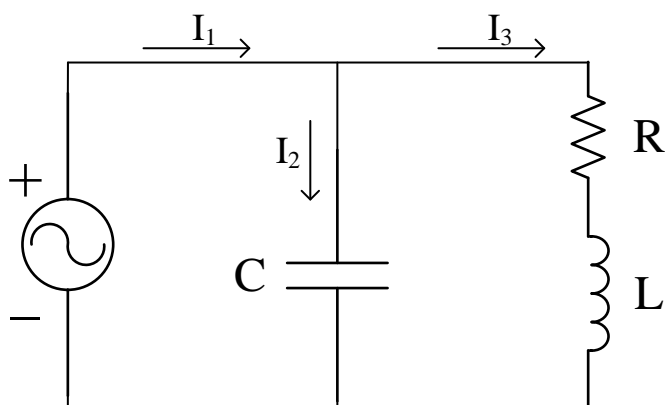


Figura 3: Circuit



Question 1 Find the magnitude for current I_1 , in amperes.

<input type="checkbox"/>	0	0	0
1	1	1	1
2	<input type="checkbox"/>	2	2
3	3	3	3
4	4	<input type="checkbox"/>	<input type="checkbox"/>
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Question 2 Find the power factor in the RL branch (leading or lagging).

<input type="checkbox"/>	0	0
1	1	1
2	2	2
3	3	<input type="checkbox"/>
4	4	4
5	5	5
6	6	6
7	<input type="checkbox"/>	7
8	8	8
9	9	9

Question 3 Find the power factor as seen from the voltage source (leading or lagging).

<input type="checkbox"/>	0	0
1	1	<input type="checkbox"/>
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	<input type="checkbox"/>	9



Question 4 Describe the procedure and assumptions that should be followed to find the capacitor that adjusts the power factor to a specific value.

0	0.5	1	1.5	2	2.5	
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Name:

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0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

In the following circuit, where source voltage is $V_s = 127$ V, current and active power measurements were taken:

- $I_2 = 1$ A;
- $I_3 = 3$ A;
- $P_3 = 280$ W (measured in RL branch)

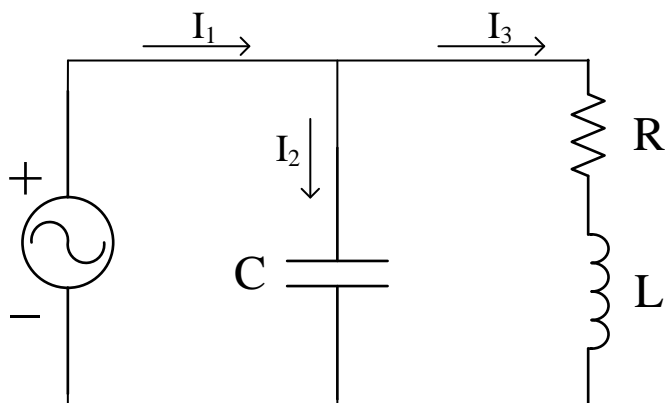


Figura 4: Circuit



Question 1 Find the magnitude for current I_1 , in amperes.

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text"/>	<input type="text"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>

Question 2 Find the power factor in the RL branch (leading or lagging).

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>

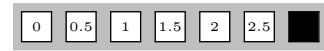
Question 3 Find the reactive power supplied by the voltage source, in VAR.

<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text"/>	<input type="text" value="1"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text"/>	<input type="text" value="3"/>	<input type="text"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text"/>	<input type="text" value="9"/>



+4/3/46+

Question 4 Describe the procedure and assumptions that should be followed to find the capacitor that adjusts the power factor to a specific value.





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0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

In the following circuit, where source voltage is $V_s = 220$ V, current and active power measurements were taken:

- $I_2 = 2$ A;
- $I_3 = 3$ A;
- $P_3 = 400$ W (measured in RL branch)

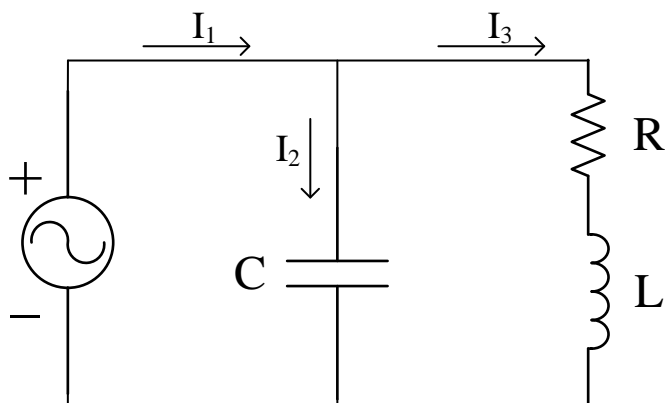
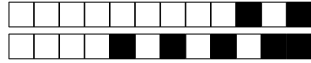


Figura 5: Circuit



Question 1 Find the magnitude for current I_1 , in amperes.

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text"/>	<input type="text" value="8"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>

Question 2 Find the power factor in the RL branch (leading or lagging).

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
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<input type="text" value="6"/>	<input type="text"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="8"/>
<input type="text" value="9"/>	<input type="text" value="9"/>	<input type="text" value="9"/>

Question 3 Find the power factor as seen from the voltage source (leading or lagging).

<input type="text"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
<input type="text" value="2"/>	<input type="text" value="2"/>	<input type="text" value="2"/>
<input type="text" value="3"/>	<input type="text" value="3"/>	<input type="text" value="3"/>
<input type="text" value="4"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input type="text" value="6"/>	<input type="text" value="6"/>	<input type="text" value="6"/>
<input type="text" value="7"/>	<input type="text" value="7"/>	<input type="text" value="7"/>
<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text"/>
<input type="text" value="9"/>	<input type="text"/>	<input type="text" value="9"/>



+5/3/42+

Question 4 Describe the procedure and assumptions that should be followed to find the capacitor that adjusts the power factor to a specific value.

0	0.5	1	1.5	2	2.5	
---	-----	---	-----	---	-----	--



+5/4/41+