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)

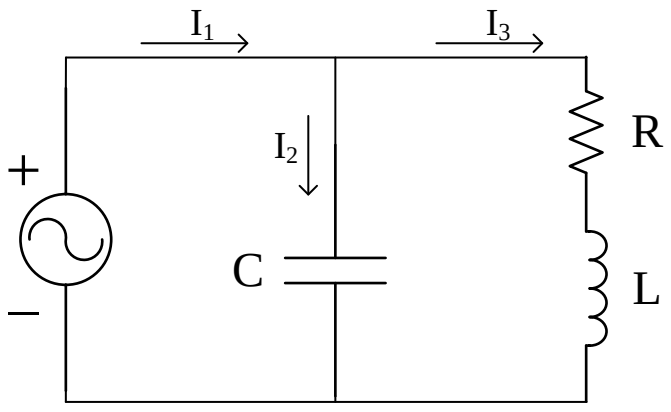

Figura 1: Circuit

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

0 0 0 0
1 1 1 1
2 2 2 2
3 3 3 3
4 4 4 4
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).

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

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

0 0 0
1 1 1
2 2 2
3 3 3
4 4 4
5 5 5
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	3

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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)

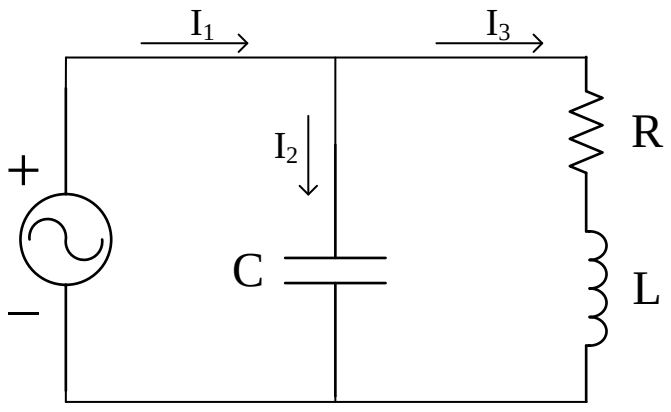


Figura 2: Circuit

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

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
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).

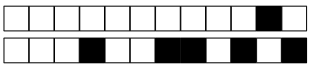
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9 ·	9	9

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

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



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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)

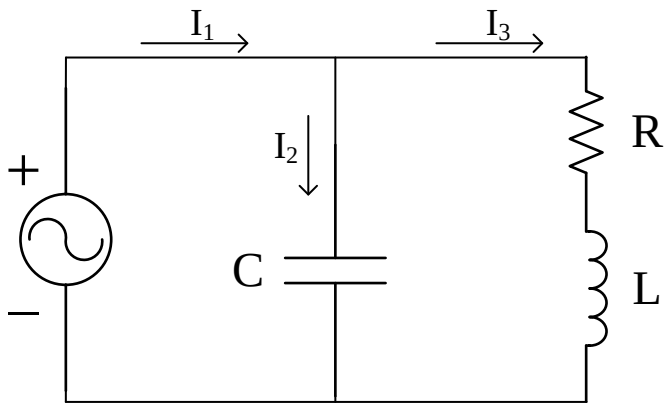


Figura 3: Circuit

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

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
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).

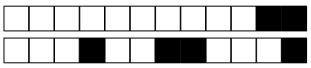
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	· 9	9

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

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
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	3



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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)

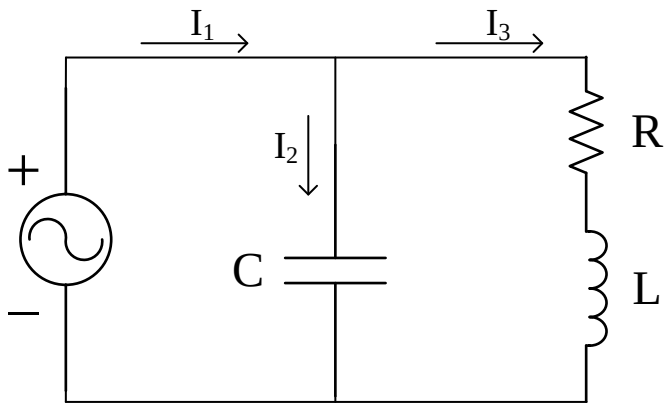


Figura 4: Circuit

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

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
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).

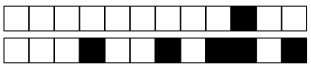
0	0	0	
1	1	1	
2	2	2	
3	3	3	
4	4	4	
5	5	5	
6	6	6	
7	7	7	
8	8	8	
9	·	9	9

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

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



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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 $V_s = 220$ V, current and active power measurements were taken:

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

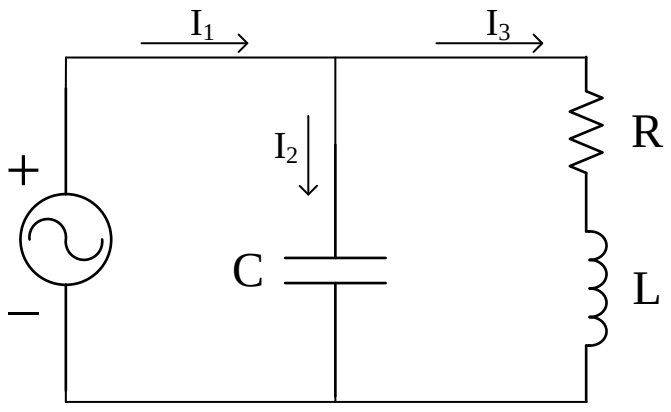

Figura 5: Circuit

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

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
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).

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

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

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
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	3