

Name:

## Student ID:

| $\boxed{0} \boxed{0}$   | 0        | 0 0   | 0        | 0 | 0        |
|---|----------|-------|----------|---|----------|
| 1 1   | 1        | 1 1   | 1        | 1 | 1        |
| $\fbox{2} \ \fbox{2}$   | 2        | 2 $2$ | 2        | 2 | 2        |
| 3 3   | 3        | 3 $3$ | 3        | 3 | 3        |
| $\boxed{4} \boxed{4}$   | 4        | 4 4   | 4        | 4 | 4        |
| $\begin{bmatrix} 5 \end{bmatrix} \begin{bmatrix} 5 \end{bmatrix}$ | <b>5</b> | 5 $5$ | <b>5</b> | 5 | <b>5</b> |
| 6 6   | 6        | 6 6   | 6        | 6 | 6        |
| 7 7   | 7        | 7 7   | 7        | 7 | 7        |
| 8 8   | 8        | 8 8   | 8        | 8 | 8        |
| $\boxed{9} \boxed{9}$   | 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:

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

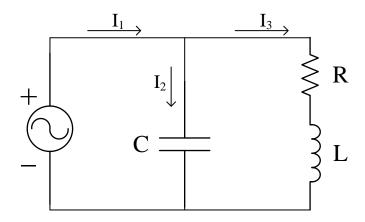
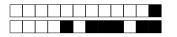


Figura 1: Circuit



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

| $\begin{bmatrix} 0 & 0 \\ 1 & 1 \\ 2 & 2 \end{bmatrix}$ | 0      | 1 |
|---|--------|---|
| 2 2<br>3 3<br>4 4                                       | 3<br>4 | 3 |
| 5 5 6 6   | 5      | 5 |
| 7 7 8 8   | 7      | 7 |
| 9 9   | . 9    | = |

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

| 0 | 0   | = |
|---|-----|---|
| 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 |

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**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: .....

## Student ID:

| 0 0 0 0 0 0 0                     |
|-----------------------------------|
| 1111111                           |
| 2 2 2 2 2 2 2 2                   |
| 3 3 3 3 3 3 3                     |
| 4 4 4 4 4 4 4                     |
| 5 5 5 5 5 5 5                     |
| 6 6 6 6 6 6 6                     |
| 7 7 7 7 7 7 7 7                   |
| 88888888                          |
| [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:

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

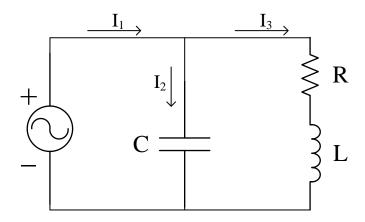


Figura 2: Circuit

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

| $ \begin{array}{c c} \hline 0 & 0 \\ \hline 1 & 1 \\ \hline 2 & 2 \\ \end{array} $ | $ \begin{array}{c c} 0 & 0 \\ \hline 1 & 1 \\ \hline 2 & 2 \end{array} $ |
|--|--|
| 3 3  | 3 3  |
| $\boxed{4} \boxed{4}$  | 4 $4$  |
| 5 5  | $\begin{bmatrix} 5 \end{bmatrix} \begin{bmatrix} 5 \end{bmatrix}$        |
| 6 6  | 6 6  |
| 7 7  | 7 7  |
| 8 8  | 8 8  |
| 9 9 9  | 99   |

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 | = |
| 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 |





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Name:

## Student ID:

| $\boxed{0} \boxed{0}$ | 0        | 0        | 0 | 0        | 0 | 0 |
|-----------------------|----------|----------|---|----------|---|---|
| 1 1                   | 1        | 1        | 1 | 1        | 1 | 1 |
| $\fbox{2} \ \fbox{2}$ | 2        | 2        | 2 | 2        | 2 | 2 |
| 3 3                   | 3        | 3        | 3 | 3        | 3 | 3 |
| 4 4                   | 4        | 4        | 4 | 4        | 4 | 4 |
| <b>5 5</b>            | <b>5</b> | <b>5</b> | 5 | <b>5</b> | 5 | 5 |
| $\boxed{6} \boxed{6}$ | 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  $V_s=127~{\rm V},$  current and active power measurements were taken:

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

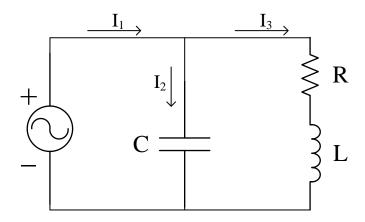


Figura 3: Circuit



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

| $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ | 0<br>1 |   |
|--|--------|---|
| 2 2  | 2      | _ |
| 3 3  | 3      | 3 |
| 4 $4$  | 4      | 4 |
| 5 5  | 5      | 5 |
| $\boxed{6}\boxed{6}$                           | 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<br>1 1 1<br>2 2 2<br>3 3 3<br>4 4 4<br>5 5 5<br>6 6 6<br>7 7 7<br>8 8 8<br>9 • 9 9    |                 |   |   |
|---|-----------------|---|---|
| 2     2       3     3       4     4       5     5       6     6       7     7       8     8 | =               | = | = |
| 3     3       4     4       5     5       6     6       7     7       8     8               | =               | = | = |
| 4     4       5     5       6     6       7     7       8     8                             | =               | = | = |
| 6 6 6<br>7 7 7<br>8 8 8   | =               | = | = |
| 7 7 7<br>8 8 8 8  | 5               | 5 | 5 |
| 8 8 8   | =               | = | = |
|   | =               | = | = |
|   | $\frac{8}{9}$ . | = | = |

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 |

+3/3/50+



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Name:

## Student ID:

| $\boxed{0} \boxed{0}$   | 0   | 0   | 0        | 0 | 0        |
|---|-----|-----|----------|---|----------|
| 1 1   | 1 1 | . 1 | 1        | 1 | 1        |
| $\fbox{2} \ \fbox{2}$   | 2 2 | 2 2 | 2        | 2 | 2        |
| 3 3   | 3   | 3   | 3        | 3 | 3        |
| $\boxed{4} \boxed{4}$   | 4   | 4   | 4        | 4 | 4        |
| $\begin{bmatrix} 5 \end{bmatrix} \begin{bmatrix} 5 \end{bmatrix}$ | 5 5 | 5 5 | <b>5</b> | 5 | <b>5</b> |
| 6 6   | 6   | 6   | 6        | 6 | 6        |
| 7 7   | 7   | 7   | 7        | 7 | 7        |
| 8 8   | 8 8 | 8   | 8        | 8 | 8        |
| $\boxed{9} \boxed{9}$   | 9 9 | 9   | 9        | 9 | 9        |

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

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

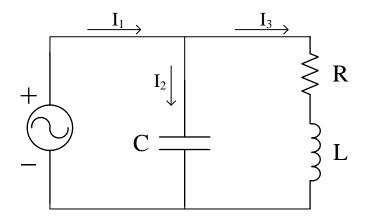


Figura 4: Circuit



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

| 0 0<br>1 1<br>2 2 | $ \begin{array}{c c} 0 & 0 \\ \hline 1 & 1 \\ \hline 2 & 2 \end{array} $ |
|-------------------|--|
| 3 3               | 3 3  |
| 4 4               | 4  |
| 5 5               | $\begin{bmatrix} 5 \end{bmatrix} \begin{bmatrix} 5 \end{bmatrix}$        |
| 6 6               | 6 6  |
| 7 7               | 7 7  |
| 8 8               | 8 8  |
| 9 9 9             | 99   |

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

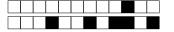
| 0 |   | = | 0        |
|---|---|---|----------|
| 2 |   | = | 2        |
| 3 |   | = | 3        |
| 4 |   | 4 | 4        |
| 5 |   | = | 5        |
| 6 |   | = | 6        |
| 7 |   | = | 7        |
| 8 |   | 8 | $\equiv$ |
| 9 | • | 9 | 9        |

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

| 0      |   | _  | 0      | $\overline{}$ |
|--------|---|----|--------|---------------|
| 1<br>2 | 2 | 2  | 1 2    | 2             |
| 3<br>4 |   |    | 3<br>4 |               |
| 5      |   |    | 5      |               |
| 6<br>7 |   |    | 6<br>7 |               |
| 8      |   | _  | 8      |               |
| 9      | 9 | 9. | 9      | 9             |









Name: .....

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| $\boxed{0} \boxed{0}$ | 0        | 0        | 0 | 0        | 0 | 0 |
|-----------------------|----------|----------|---|----------|---|---|
| 1 1                   | 1        | 1        | 1 | 1        | 1 | 1 |
| $\fbox{2} \ \fbox{2}$ | 2        | 2        | 2 | 2        | 2 | 2 |
| 3 3                   | 3        | 3        | 3 | 3        | 3 | 3 |
| 4 4                   | 4        | 4        | 4 | 4        | 4 | 4 |
| <b>5 5</b>            | <b>5</b> | <b>5</b> | 5 | <b>5</b> | 5 | 5 |
| $\boxed{6} \boxed{6}$ | 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  $V_s=220~{\rm V},$  current and active power measurements were taken:

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

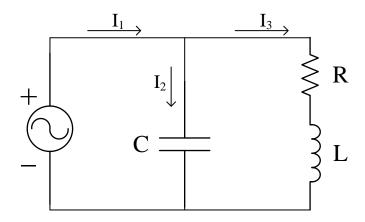
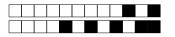


Figura 5: Circuit



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

| 0 0<br>1 1<br>2 2<br>3 3 | 0 0<br>1 1<br>2 2<br>3 3 |
|--------------------------|--------------------------|
| 4 4                      | 4 4                      |
| 5 5<br>6 6               | 5 5<br>6 6               |
| 7     7       8     8    | 7     7       8     8    |
| 9 9                      | 9 9                      |

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

| 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 |

+5/3/42+



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