Title: **Impedance Triangle** Test: 13

Course: Electrical Applications Unit: Electrical Theory CLO: 3

Name ANSWER KEY Grade 40pts Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall identify specific characteristics of an inductor.
2. Student shall calculate various resistance, reactance and impedance quantities based on given information.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Test. Grading shall be based on an answer key.

**Instructions**

Select the best answer to each multiple-choice question below.

1. Increasing the turns in an inductor will:
2. Increase the inductance
3. Decrease the inductance
4. Have no effect on the inductance
5. Increasing the length of the inductor will:
6. Increase the inductance
7. Decrease the inductance
8. Have no effect on the inductance
9. Increasing the area of the coil inside an inductor will:
10. Increase the inductance
11. Decrease the inductance
12. Have no effect on the inductance
13. An inductors value can be increased by changing the core material to be:
14. More Permeable
15. Less Permeable
16. Magnetic
17. If inductance is increased, the inductive reactance (XL)?
18. Increases
19. Decreases
20. Remains the same
21. It is possible for a resistive-inductive (RL) circuit to have a phase angle of 0˚.
22. True
23. False
24. In an inductor, the following statement is true.
25. Voltage Leads Current
26. Current Leads Voltage
27. Voltage and Current are “In Phase”
28. If resistance is increased in a resistive-inductive (RL) circuit, the phase angle will?
29. Increase
30. Decrease
31. Stay the same
32. An inductor stores energy in the form of?
33. Electromagnetism
34. Voltage
35. Current
36. Watts
37. Inductance is represented in formulas by the letter(s)?
38. XL
39. H
40. L
41. R
42. Inductive reactance is represented in formulas by the letter(s)?
43. XL
44. H
45. L
46. R
47. Inductance is measured in?
48. XL
49. H
50. L
51. R

**Instructions**

Give the known quantities in the table below, calculate the unknown value.

|  |  |  |  |
| --- | --- | --- | --- |
|  | f | L | XL |
|  | 11kHz | 460mH | 31.793kΩ |
|  | 240Hz | 240mH | 361.911Ω |
|  | 7.2kHz | 200H | 9.048MΩ |
|  | 60Hz | 150mH | 56.549Ω |
|  | 440Hz | 2H | 5.529kΩ |

**Instructions**

Given the figure below, match the component with it’s appropriate quantity.



|  |  |
| --- | --- |
| 1. Resistance A | 1. Impedance C |
| 1. Inductive Reactance B | 1. Phase Angle D |

**Instructions**

Give the known quantities in the table below, calculate the unknown values.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | R | XL | Z | θ |
|  | 300Ω | 100Ω | 316.228Ω | 18.435˚ |
|  | 280Ω | 50Ω | 284.429Ω | 10.125˚ |
|  | 2.2kΩ | 1.732kΩ | 2.8kΩ | 38.213˚ |
|  | 12.196kΩ | 4500Ω | 13kΩ | 20.252˚ |
|  | 549.998kΩ | 1.2kΩ | 550kΩ | 0.125˚ |
|  | 23Ω | 23.664Ω | 33Ω | 45.816˚ |
|  | 6.159kΩ | 4kΩ | 7.344kΩ | 33˚ |
|  | 822.191Ω | 366.063Ω | 900Ω | 24˚ |
|  | 200Ω | 167.82Ω | 261.081Ω | 40˚ |

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