**Assignment**

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| **Name** | **AHAHAHAHAHAHAHAAAASASAHAH** |
| **Lecturer** |  |
| **Date of issue** |  |
| **Due date** |  |

***Complete the attached problems.***

***You must show formulae used to calculate answers.***

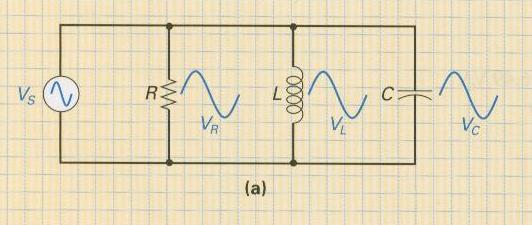
***You must draw the phasor diagrams.***

***You must show all answers with correct units of measurement.***

***WARNING CONTAINS ANSWERS***

***1)***

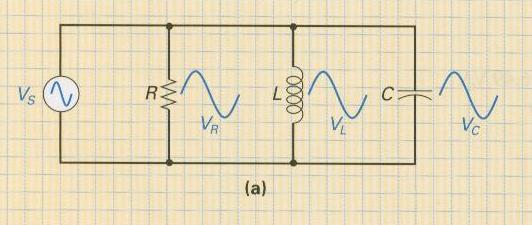
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| ***f = 100Hz*** |
| ***Vs = 230v*** |
| ***C = 3.3µF*** |
| ***L = 2.5H*** |
| ***R = 1800Ω*** |

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| --- | --- |
| XL = = 1.57kΩ | |
| XC= 1/ = 1/ 2 = 482Ω | |
| Draw current phasor diagram. | |
| IR = = = 0.128A (128mA) | Alternate method using polar to rectangular conversion function. |
| IL = = = 0.146A (146mA) | Z = Pol(0.128,0.331 = 0.355A (355mA)  Phase angle = RCL “F” = 68.860 |
| IC = = = 0.477A (477mA) | All other values calculated as per previous method |
| IX = Il ~ Ic = 0.477 – 0.146 = 0.331 (331mA) |  |
| IT = =  = 0.355A (355mA) |  |
| Z = = = 648Ω |  |
| Phase angle = = = 0.36 | cos-1 0.36 = 68.860 |

***2)***

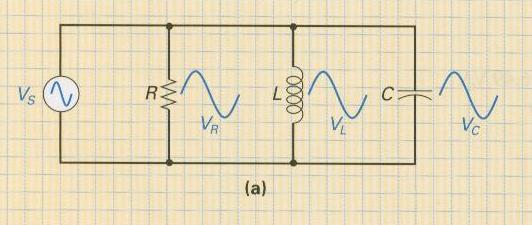
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| ***f = 50Hz*** |
| ***Vs = 230v*** |
| ***C = 68uF*** |
| ***L = 82mH*** |
| ***R = 32Ω*** |

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| --- | --- |
| XL = = 26Ω | |
| XC= 1/ = 1/ 2 = 47Ω | |
| Draw current phasor diagram. | |
| IR = = = 7.2A | Alternate method using polar to rectangular conversion function. |
| IL = = = 8.85A | Z = Pol(7.2,3.95 = 8.2A  Phase angle = RCL “F” = -28.750 |
| IC = = = 4.9A | All other values calculated as per previous method |
| IX = Il ~ Ic = 8.85A – 4.9A = 3.95A |  |
| IT = =  = 8.2A |  |
| Z = = = 28Ω |  |
| Phase angle = = = 0.88 | cos-1 0.88 = 28.590 |

***3)***

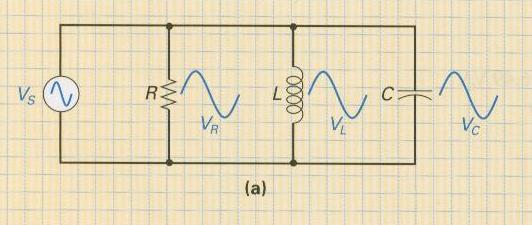
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| ***f = 1kHz*** |
| ***Vs = 230V*** |
| ***C = 6.3uF*** |
| ***L = 3mH*** |
| ***R = 35Ω*** |

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| XL = = 19Ω | |
| XC= 1/ = 1/ 2 = 25Ω | |
| Draw current phasor diagram. | |
| IR = = = 6.6A | Alternate method using polar to rectangular conversion function. |
| IL = = = 12.1A | Z = Pol(6.6,2.9 = 7.2A  Phase angle = RCL “F” = -23.720 |
| IC = = = 9.2A | All other values calculated as per previous method |
| IX = Xl ~ Xc = 12.1 – 9.2 = 2.9A |  |
| IT = =  = 7.2A |  |
| Z = = = 32Ω |  |
| Phase angle = = = 0.917 | cos-1 0.917 = -23.520 |

***4)***

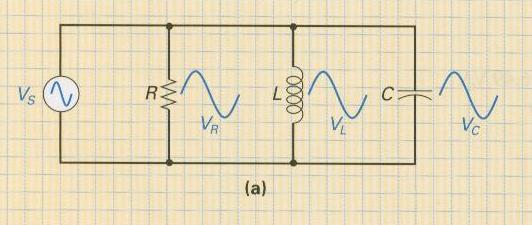
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| ***f = 50Hz*** |
| ***Vs = 240V*** |
| ***C = 2.2uF*** |
| ***L = 2.7H*** |
| ***R = 820Ω*** |

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| XL = = 848Ω | |
| XC= 1/ = 1/ 2 = 1.45kΩ | |
| Draw current phasor diagram. | |
| IR = = = 0.290A (290mA) | Alternate method using polar to rectangular conversion function. |
| IL = = = 0.283A (283mA) | Z = Pol(0.290,0.117 = 0.313A (313mA)  Phase angle = RCL “F” = -21.970 |
| IC = = = 0.166A (166mA) | All other values calculated as per previous method |
| IX = Xl ~ Xc = 0.283 – 0.166 = 0.117 (117mA) |  |
| IT = = = 0.313A (313mA) |  |
| Z = = = 767Ω |  |
| Phase angle = = = 0.93 | cos-1 0.93 = -22.10 |

***5)***

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| ***f = 1.5kHz*** |
| ***Vs = 230V*** |
| ***C = 15nF*** |
| ***L = 330mH*** |
| ***R = 3.3kΩ*** |

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| XL = = 3.1kΩ | |
| XC= 1/ = 1/ 2 = 7.1Ω | |
| Draw current phasor diagram. | |
| IR = = = 0.070A (70mA) | Alternate method using polar to rectangular conversion function. |
| IL = = = 0.074A (74mA) | Z = Pol(0.07,0.042 = 0.082A (82mA)  Phase angle = RCL “F” = -30.960 |
| IC = = = 0.032A (32mA) | All other values calculated as per previous method |
| IX = Xl ~ Xc = 0.074 – 0.032 = 0.042 (42mA) |  |
| IT = = = 0.082A (82mA) |  |
| Z = = = 2.805kΩ |  |
| Phase angle = = = 0.917 | cos-1 0.917 = -23.520 |