CPE 1150

Lab Number: 4

Parallel

AC Circuit

Analysis

Team member:

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Measurement based calculations:

initial measurements table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| R1 | R3 | R4 | L1 | C1 | Z t “calculated” |
| 561Ω | 10.1Ω | 10.1Ω | 13.65mH | 33.6nF |  |

Total current data:

|  |  |
| --- | --- |
| VR3 | VR1 |
| 0.01 V | 0.08V |

Branch current measurements

|  |  |
| --- | --- |
| VR3 | VR4 |
| 160 mV | 160mV |

Constant source voltage was not obtainable during the lab

Prelab:

XL=2πfL = 471.238

XC = ­ = 964.575

=

Z total = 478.415<31.31o

Table 1: reactance calculations

|  |  |  |  |
| --- | --- | --- | --- |
| R1 | L1 | C1 | Z t |
| 560<0o | 471.238<90o | 964.575<-90o | 478.415<31.31o |

­source

DC current divider:

I target = I source\* (DC chapter current divider R changed to Z)

I resistor = 6.271mA<-31.31o\*

AC current divider:

I target =

Table 2 && 3: current per parallel element (peak values)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Method of calculation | It | IR1 | IL1 | I­C1 |
| Current divider  (DC chapter) | 6.271mA<-31.31o | 0.1347nA<90o | 0.1347nA<90o | 4.686mA<49.92o |
| Ohms law  (V/Z branch = I) | 6.271mA<-31.31o | 5.357mA | 6.366mA<-90o | 2.894mA<-90o |
| Current divider  (AC chapter) | 6.271mA<-31.31o | 5.311mA<62.62o | 6.312mA<-27.38O | 2.738<-27.38o |
| Matrix  (Linear algebra) |  |  |  |  |