Hanoi University of Science and Technology

School of Engineering Physics

LAB REPORT

For Electrics and Thermodynamics

PH1026

**Experiment 1**

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**Experiment 1**

**Measurement of Resistance, Capacitance, Inductance**

**and Resonant Frequencies of RLC using Oscilloscope**

1. **Measurement of resistance, capacitance, and inductance**
   1. **Measurement of unknown resistance**

|  |  |  |  |
| --- | --- | --- | --- |
| **f (Hz)** | **R­0 (Ω)** | **R­x (Ω)** | **ΔR­x (Ω)** |
| 500 | 332.0 | 332.0 | 0.3 |
| 1000 | 332.0 | 332.0 | 0.3 |
| 1500 | 331.0 | 331.0 | 0.7 |
|  |  | **331.7** | **0.4** |

**Result:**

* 1. **Measurement of unknown capacitance**

|  |  |  |  |
| --- | --- | --- | --- |
| **f (Hz)** | **Zc = R­0 (Ω)** | **ΔZc (Ω)** |  |
| 1000 | 154.0 | 154.0 | 1.033 |
| 2000 | 78.0 | 78.0 | 1.020 |
| 3000 | 52.0 | 52.0 | 1.020 |
|  |  |  | **1.024** |

* 1. **Measurement of unknown inductance**

|  |  |  |
| --- | --- | --- |
| **f (Hz)** | **R­0 (Ω)** |  |
| 10000 | 57.5 |  |
| 20000 | 114.0 | 0.907 |
| 30000 | 105.0 |  |
|  |  |  |

1. **Determination of resonant frequency of RLC circuit** 
   1. **Series RLC circuit**

|  |  |  |
| --- | --- | --- |
| **Trial** | **fs (kHz) (series circuit)** |  |
| 1 | 5.283 | 0.056 |
| 2 | 5.231 | 0.094 |
| 3 | 5.167 | 0.060 |
|  |  |  |

* 1. **Parallel RLC circuit**

|  |  |  |
| --- | --- | --- |
| **Trial** | **fp (kHz) (parallel circuit)** |  |
| 1 | 5.385 | 0.074 |
| 2 | 5.216 | 0.095 |
| 3 | 5.332 | 0.021 |
|  |  |  |

***\*\*\* Comparison***

Theoretical frequency:

From those results we have following conclusions:

- The measured frequency of parallel RLC circuit is a little bigger than those of series circuit.

- The resonant frequency is quite different from two frequencies obtain of series and parallel RLC because of low-quality equipment.