**Prelab-9 Worksheet**

**Circuit Analysis – I**

|  |  |
| --- | --- |
| Student Name(s): |  |
| Student ID(s): |  |

**Task 1:**

**LTspice Screenshot # 1: Circuit # 1**

Put screenshot of the simulated plots from LTspice. Include only the plot window (containing ); do not put the circuit schematic.

**Table 1: Circuit 1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Freq** | **Period** | **Peak-to-Peak of** | **Peak-to-Peak of** | **Peak-to-Peak of** |
| Prelab Simulation |  |  |  |  |  |

**Task 2:**

**Analytical Calculations: Circuit #2**

Include step-by-step calculations used to complete the prelab values for Tables 2 and 3

**Table 2: Circuit 2 (Capacitor Voltage)**

**Calculated Time Constant (τ) = \_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **R1 Voltage during Charging Phase** | | | | | |
| Time Stamp | t = 0 µs  (rising edge of source voltage VS) | t = 100 µs | t = 200 µs | t = 300 µs | t = 400 µs | t = 500 µs  (falling edge of source voltage VS) |
| Calculated Values |  |  |  |  |  |  |
|  | **R1 Voltage during Discharging Phase** | | | | | |
| Time Stamp | t = 0 µs  (falling edge of source voltage VS) | t = 100 µs | t = 200 µs | t = 300 µs | t = 400 µs | t = 500 µs  (rising edge of source voltage VS) |
| Calculated Values |  |  |  |  |  |  |

**Table 3: Circuit 2 (Resistor Voltage)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Capacitor Voltage during Charging Phase** | | | | | |
| Time Stamp | t = 0 µs  (rising edge of source voltage VS) | t = 100 µs | t = 200 µs | t = 300 µs | t = 400 µs | t = 500 µs  (falling edge of source voltage VS) |
| Calculated Values |  |  |  |  |  |  |
|  | **Capacitor Voltage during Discharging Phase** | | | | | |
| Time Stamp | t = 0 µs  (falling edge of source voltage VS) | t = 100 µs | t = 200 µs | t = 300 µs | t = 400 µs | t = 500 µs  (rising edge of source voltage VS) |
| Calculated Values |  |  |  |  |  |  |

**Task 3:**

**LTspice Screenshot # 2: Circuit # 2**

Put screenshot of the simulated plots from LTspice. Include only the plot window (containing  **and** ); do not put the circuit schematic.

**Task 4:**

**Analytical Calculations: Circuit #3**.Include step-by-step calculations used to complete Table 4

**Table 4: Circuit 3**

**Calculated Time Constant (τ) = \_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Inductor Current during Charging Phase** | | | | | |
| Time Stamp | t = 0 µs  (rising edge of Vs) | t = 50 µs | t = 100 µs | t = 150 µs | t = 200 µs | t = 250 µs  (falling edge of Vs) |
| Calculated Values |  |  |  |  |  |  |
|  | **Inductor Current during Discharging Phase** | | | | | |
| Time Stamp | t = 0 µs  (falling edge of Vs) | t = 50 µs | t = 100 µs | t = 150 µs | t = 200 µs | t = 250 µs  (rising edge of Vs) |
| Calculated Values |  |  |  |  |  |  |

**Task 5:**

**LTspice Screenshot # 3: Circuit # 3**

Put screenshot of the simulated plots from LTspice. Include only the plot window (containing  **and** ); do not put the circuit schematic.

**Prelab-9 Submission Requirements:**

* Convert/save this Prelab-9 Worksheet **as a .pdf file** with a filename as follows:

**If Prelab is done individually:** “Prelab-9\_FirstName\_LastName.pdf”.

**If Prelab is done in a group:** If you have been explicitly instructed by your lab instructor to perform the Prelab exercises in a group, then save this Prelab-9 Worksheet **as a .pdf file** with a filename following the convention below:

Let’s consider that two students are doing the prelab in a group. Then the filename should be: “Prelab-9\_FirstName of Student 1\_FirstName of Student 2.pdf”. For example, if name of the two students are Tom Cruz and Morgan Freeman, respectively, then the Prelab-9 Worksheet file should have the following name: “Prelab-9\_Tom\_Morgan.pdf”. Similar file naming convention should be followed to properly name your LTspice schematic file. Improperly named files may be subject to point deductions.

* Check with your lab instructor about specific instructions on how to submit your Prelab files for assessment and grading.

**Prelab Score:** This prelab contributes to 30 points toward Lab 9 (each Task in the Prelab is worth 10 points). In-lab hands-on work will contribute to 70 points (Lab 9 total is 100 points).