The step numbers in this data sheet refer to those in the laboratory exercise instructions.

Step 2d:

Amplitude difference between input and output:

Step 3d:

Amplitude difference between input and output:

Step 5c:

*v*L: *v*RS:

Step 5e:

*v*L: *v*RS:

Steps 2 through 4:

Table 1. Calculated and measured rectifier data.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Rectifier | Prelab Calculations | | | | Experimental | | |
| *v*o,peak (V) | Conduction Angle, ϕ (degrees) | *V*avg (V) | *V*r,p-p (V) | *v*o,peak (V) | *V*avg (V) | *V*r,p-p (V) |
| Half-wave |  |  |  |  |  |  |  |
| Full-wave |  |  |  |  |  |  |  |
| Filtered full-wave |  |  |  |  |  |  |  |

Step 5:

Table 2. Zener diode voltage regulator data.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Prelab Calculations | | | | | | Experimental | | | | | |
| *v*I (V) | *i*S (mA) | *i*Z (mA) | *i*L (mA) | *v*L (V) | *P*RS (mW) | *P*Z (mW) | *i*S (mA) | *i*Z (mA) | *i*L (mA) | *v*L (V) | *P*RS (mW) | *P*Z (mW) |
| 8 |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |  |  |  |  |  |  |

Analysis questions 1 through 3:

Table 3. Errors between measured and calculated rectifier voltages.

|  |  |  |  |
| --- | --- | --- | --- |
| Rectifier | Peak Voltage Error (%) | Avg. Voltage Error (%) | Peak-Peak Ripple Voltage Error (%) |
| Half-wave |  |  |  |
| Full-wave |  |  |  |
| Filtered full-wave |  |  |  |

Analysis question 6:

Table 4. Errors between measured and calculated Zener diode circuit parameters at *v*I = 12 V.

|  |  |
| --- | --- |
| Parameter | Error (%) |
| Load voltage, *v*L |  |
| Zener diode current, *i*Z |  |
| Zener diode power, *P*Z |  |