

Problem 1:

A half-wave rectifier with a 1-k Ω load has a parallel capacitor. The source is 120 V_{rms}, 60 Hz. Determine the peak-to-peak ripple of the output voltage when the capacitor is

- a) 4000 μ F
- b) 20 μ F.

Problem 2:

A half-wave rectifier with a capacitor filter has $V_m=200$ V, $R=10$ k Ω , $C=1000$ μ F, and $\omega=377$.

Determine

- a) Peak-to peak ripple voltage using the exact equations.
- b) Peak-to peak ripple voltage using the approximate formula.

Problem 3:

For the controlled half-wave rectifier with resistive load, the source is 120 V_{rms} at 60 Hz. The resistance is 100 Ω , and the delay angle α is 45.

Determine

- a) average voltage across the resistor
- b) power absorbed by the resistor
- c) power factor

Problem 4:

A half-wave rectifier has a 120 V rms, 60 Hz ac source. The load is 750 Ω .

Determine

- a) value of a filter capacitor to keep the peak-to-peak ripple across the load to less than 2 V.
- b) peak values of diode current