



UNIVERSITY COLLEGE LONDON

MENG MECHANICAL ENGINEERING

MECH0071 ELECTRICAL POWER SYSTEMS AND ELECTRICAL PROPULSION

PSCAD COURSEWORK

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1 Question 1

1.1 Circuit diagram

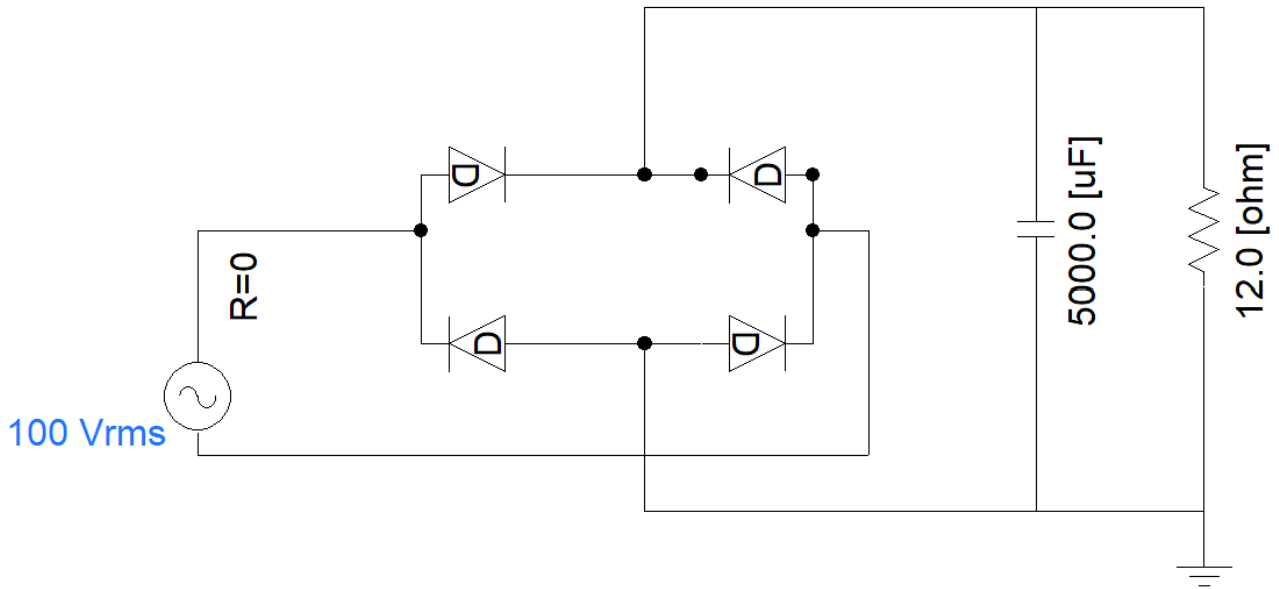


Figure 1: Circuit diagram for question 1.

1.2 Instantaneous voltages

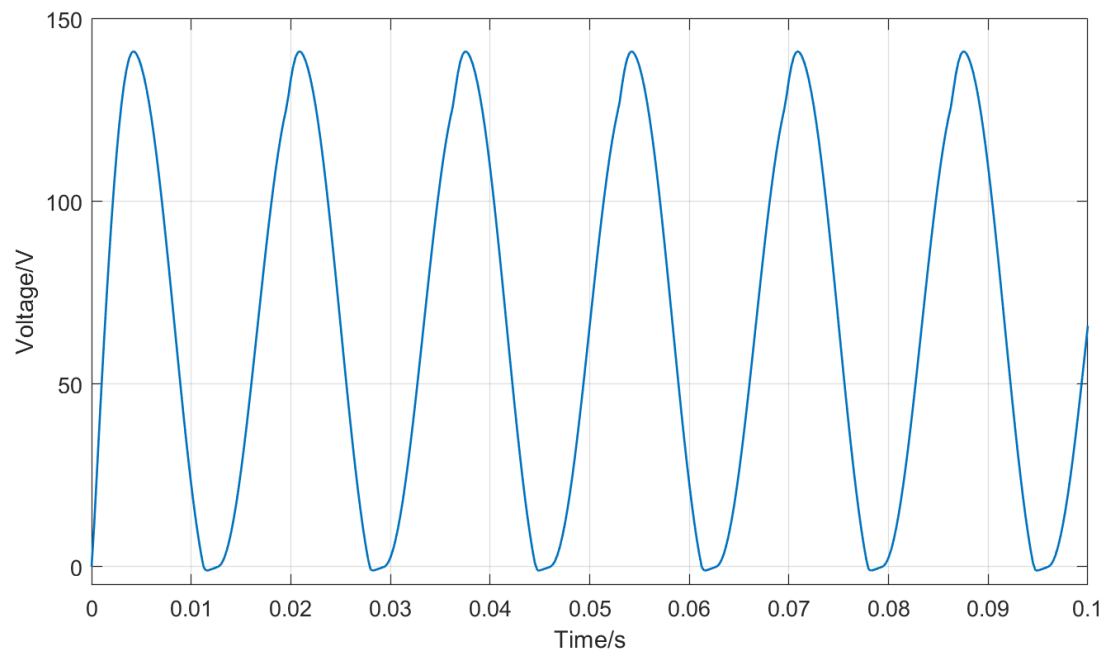


Figure 2: Graph to show instantaneous input voltage across the voltage source.

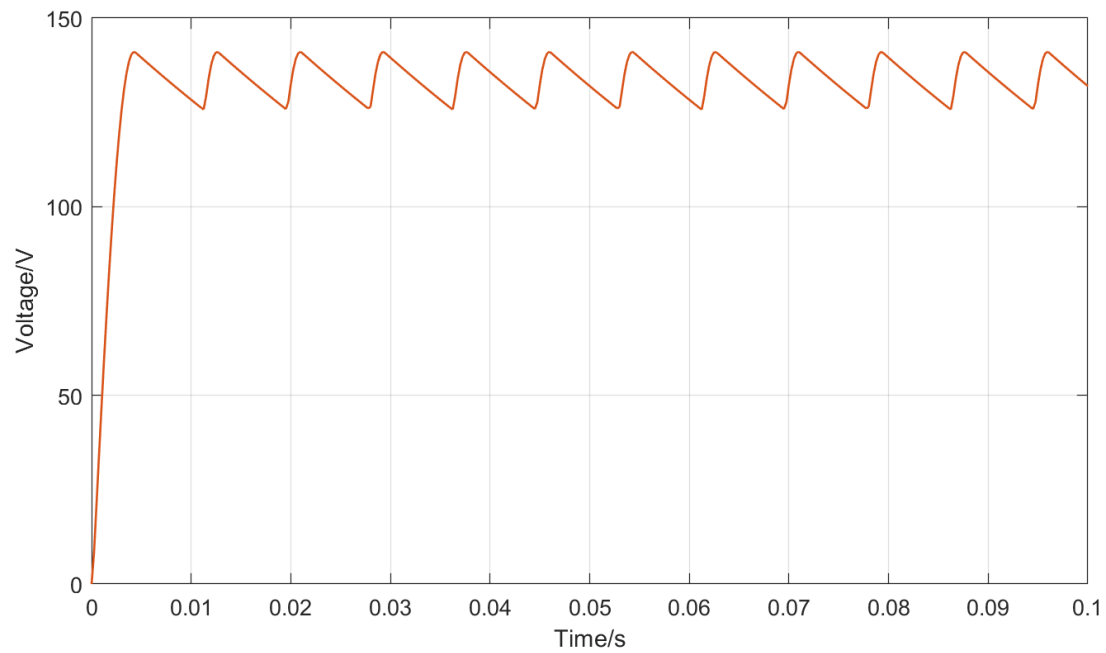


Figure 3: Graph to show instantaneous output voltage across the resistive load.

1.3 Effect of increasing capacitance to 25 μF

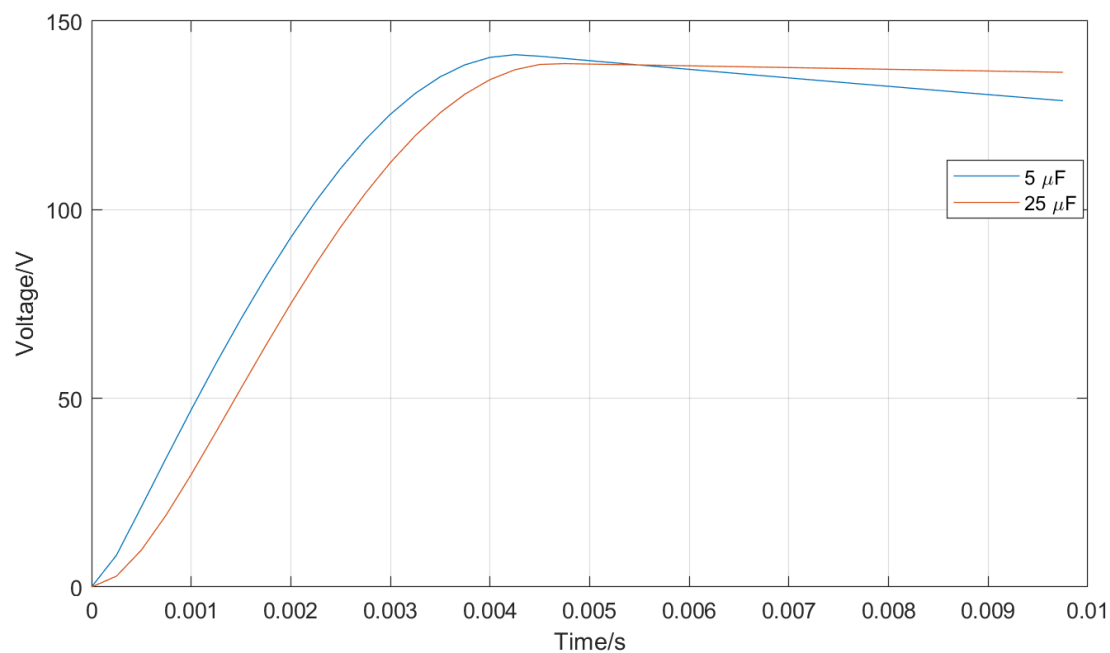


Figure 4: Graph to show comparison between instantaneous output voltage across the resistive load for different capacitance values.

The purpose of the capacitor in this diode bridge circuit is to filter/reduce the amount of voltage ripple, inherent to bridge diode circuits. We can see in Figure 3 that our voltage drop is approximately 25 V between pulses. By increasing the capacitance, our voltage drop reduces (from data: voltage drop with 25 μF \approx 4 V.) This is desirable as this achieves a more stable DC output. However, increasing the capacitance also increases the rise time and reduces the peak voltage of the output, shown in Figure 4.