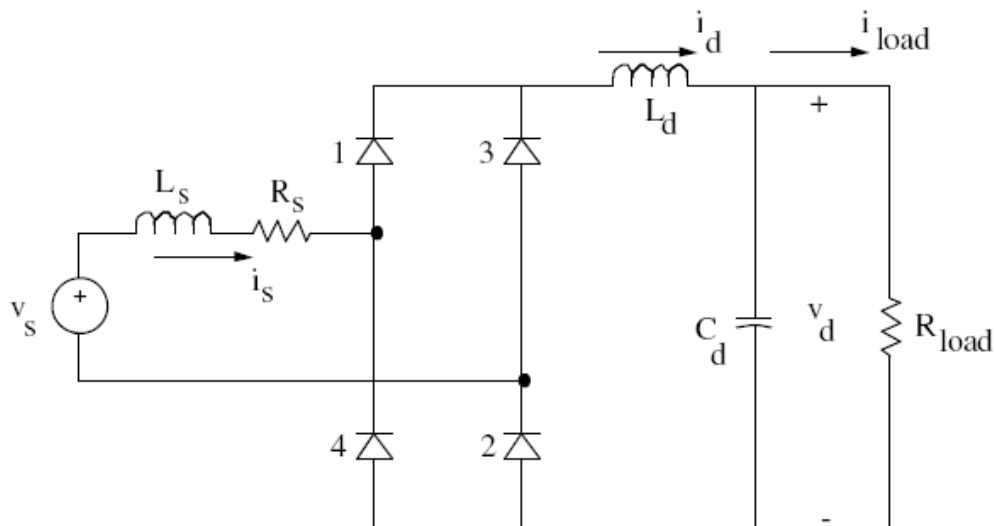


## LAB01 – 1 Phase Diode Rectifier



Nominal Values:  $V_s(\text{rms}) = 120\text{V}$  at 60 Hz  
 $L_s = 1\text{ mH}$   
 $R_s = 10\text{ m}\Omega$   
 $L_d = 1\mu\text{H}$   
 $C_d = 1,000\ \mu\text{F}$   
 $R_{\text{load}} = 20\ \Omega$

1. Simplify the circuit: remove  $L_s$ ,  $R_s$ ,  $L_d$ ,  $C_d$ . Run simulation to obtain  $v_s$ ,  $i_s$ ,  $v_d$  waveforms. Obtain  $v_d(\text{average})$ . Compare with theoretical value.
2. Substitute  $R_{\text{load}}$  by a DC current source  $I_d=10\text{A}$ . Obtain  $v_d(\text{average})$ . Compare with theoretical value.
3. Make  $L_s=3\text{ mH}$ . Obtain  $v_d(\text{average})$ . Compare with theoretical value.
4. Obtain the current commutation interval  $u$ . Compare with theoretical value.
5. Make  $C_d=1000\mu\text{F}$  (initial condition 150V). Obtain the ripple voltage  $\Delta v_d$ . Compare with theoretical value.
6. Replace the current source by  $R_{\text{load}}=20\ \Omega$ . Make  $C_d=1000\mu\text{F}$  (initial condition 150V). Obtain the ripple voltage  $\Delta v_d$ . Compare with theoretical value.