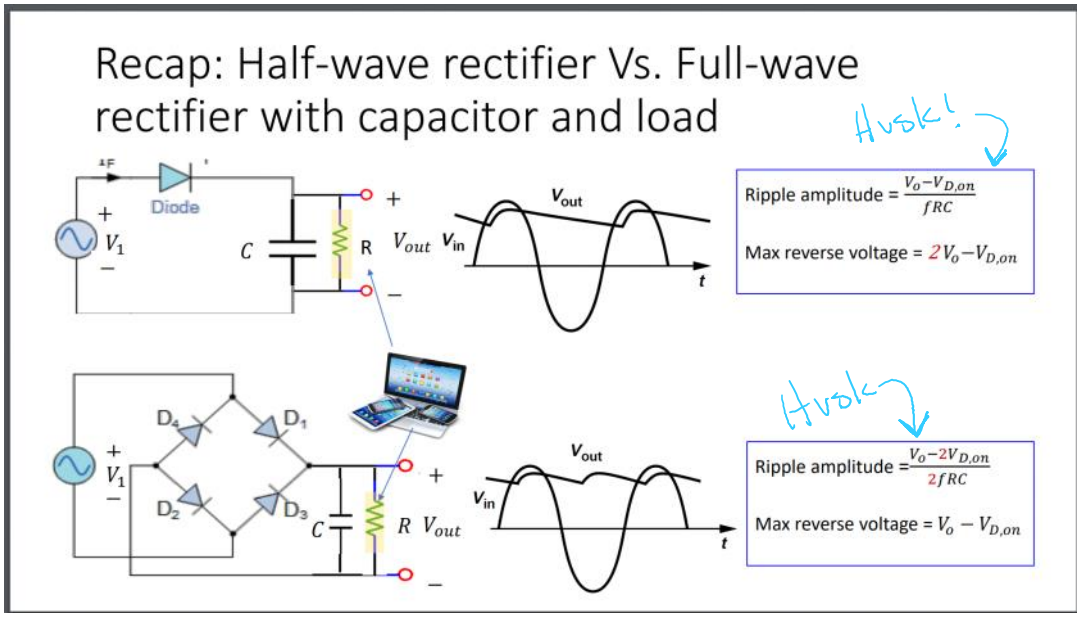
LEC-2WaveRectifiers

Thursday, 23 May 2024 09.59

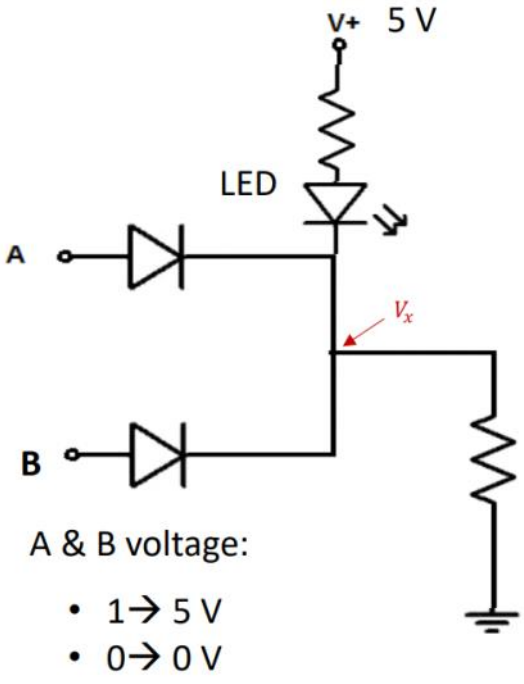


Kursusregniner:

2.1:

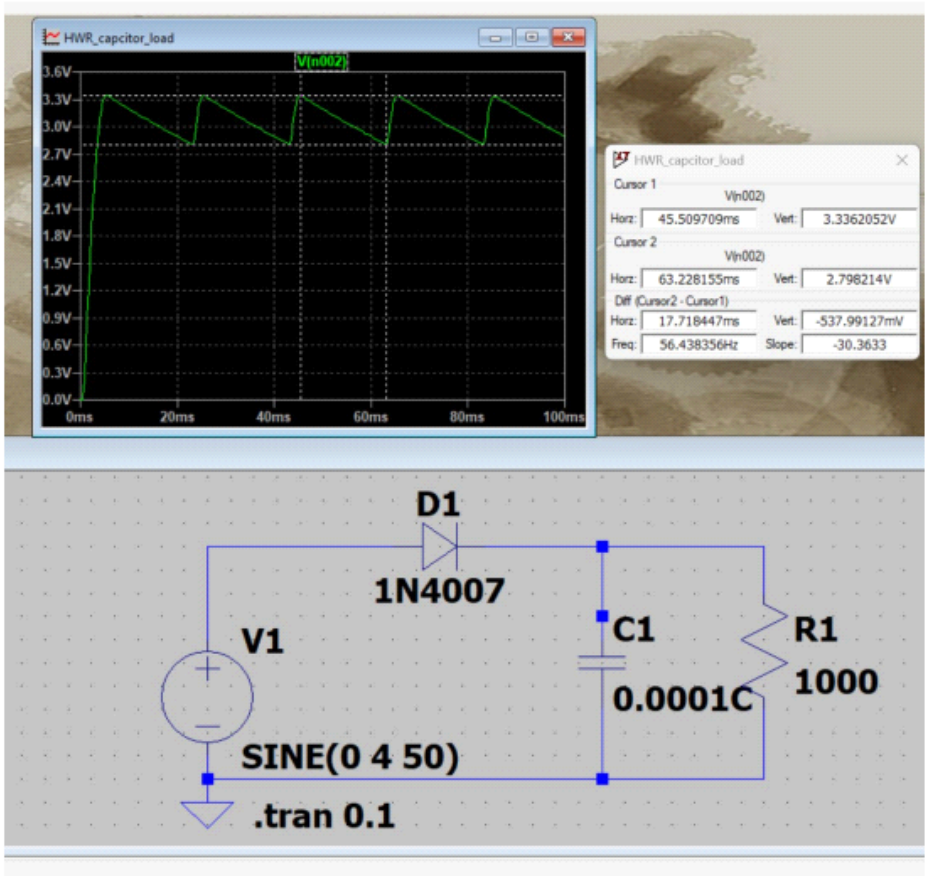
A logic circuit is shown in Fig. 1. The voltage drops of the diodes connected to A and B are 0.7 V and the voltage drop of the LED is 2 V.

- When A is connected to 0 V and B to 0 V, is the LED on or off? Why?
- When A is connected to 0 V and B to 5 V, is the LED on or off? Why?
- When A is connected to 5 V and B to 0 V, is the LED on or off? Why?
- When A is connected to 5 V and B to 5 V, is the LED on or off? Why?
- What logic gate is it?



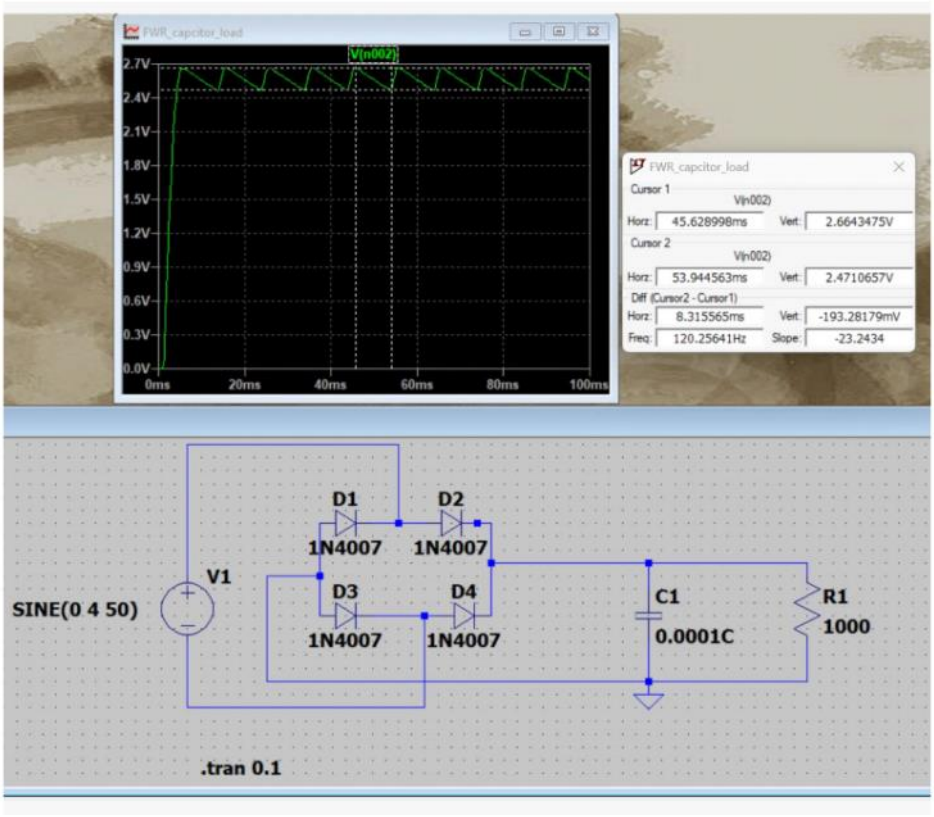
Solution:

- When A=0 (0V) and B=0(0V) ➔ diode A and B are off ➔ The voltage across the LED > 2 V ➔ LED is on (1)
- When A=0 (0V) and B=1(5V) ➔ diode A is off, but diode B is on ➔ V_x = 5-0.7 = 4.3 V ➔ The voltage across the LED = 5−V_x = 0.7 V < 2 V ➔ LED is off (0)
- When A=1 (5V) and B=0(0V) ➔ diode A is on, and diode B is off ➔ V_x = 5-0.7 = 4.3 V ➔ The voltage across the LED = 5−V_x = 0.7 V < 2 V ➔ LED is off (0)
- When A=1 (5V) and B=1(5V) ➔ diode A is on, and diode B is on➔ V_x = 5-0.7 = 4.3 V ➔ The voltage across the LED = 5−V_x = 0.7 V < 2 V ➔ LED is off (0)
- It is a NOR gate.



Halfwave
- Single diode
- Super easy

Full wave
- 4 diodes
- More complex



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