

Using 741 Opamp, design window comparator for any given VTP and LTP and simulate the same.

Window comparator:

→ It detects when input voltage is between two limits called window.

→ Use two comparators with different thresholds

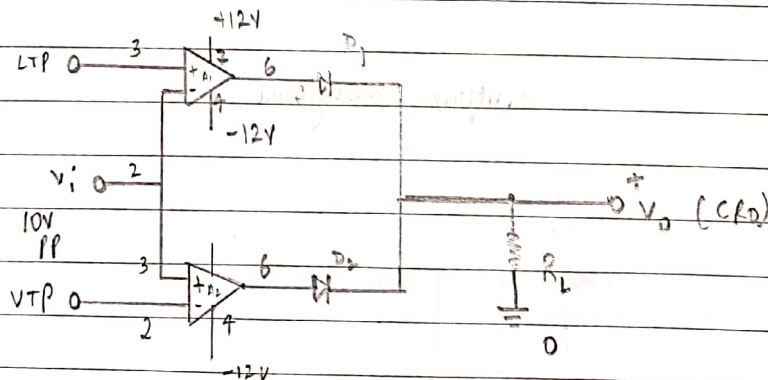
→ A window comparator is basically the inverting and non-inverting comparators combined into a single comparator stage.

→ The window comparator detects input voltage levels that are within a specific band or window of voltages. Instead of indicating whether a voltage is greater or less than some preset or fixed voltage reference point.

→ This time, instead of having just one reference voltage value, a window comparator will have 2 reference voltages implemented by a pair of voltage comparators.

→ One which triggers an op-amp comparator on detection of some upper voltage threshold,  $V_{ref(upper)}$  and one which triggers an op-amp comparator on detection of a lower voltage threshold level,  $V_{ref(lower)}$

→ Then the voltage levels between these 2 upper and lower reference voltages is called the "window" hence its name.



Circuit diagram for window comparator

Components required:

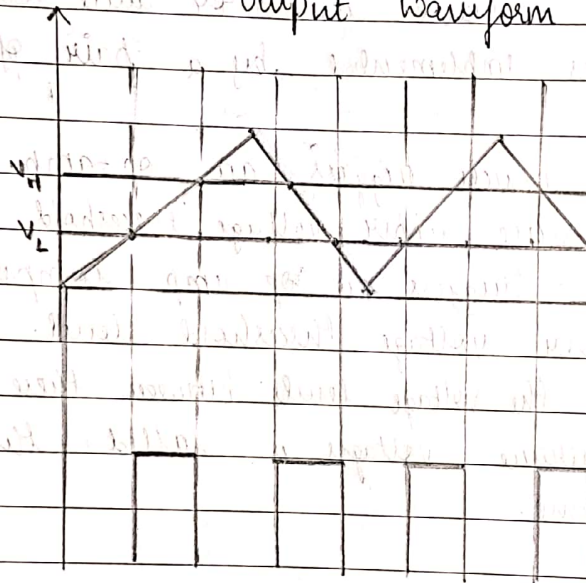
Two op-amp IC  $\mu A 741$  2 diode,  $1N4007$   
Resistor of  $1k\Omega$ , DC regulated power supply,  
trainer kit (+12V and -12V is given to op amp  
from this), signal generator, CRO.

$$V_i > LTP$$

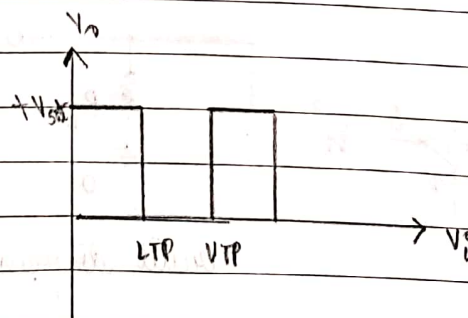
$$V_i < VTP$$

$V_i$  crosses the limit than  $D_1, D_2 \rightarrow$  Forward  
biased  $V_o = 1$

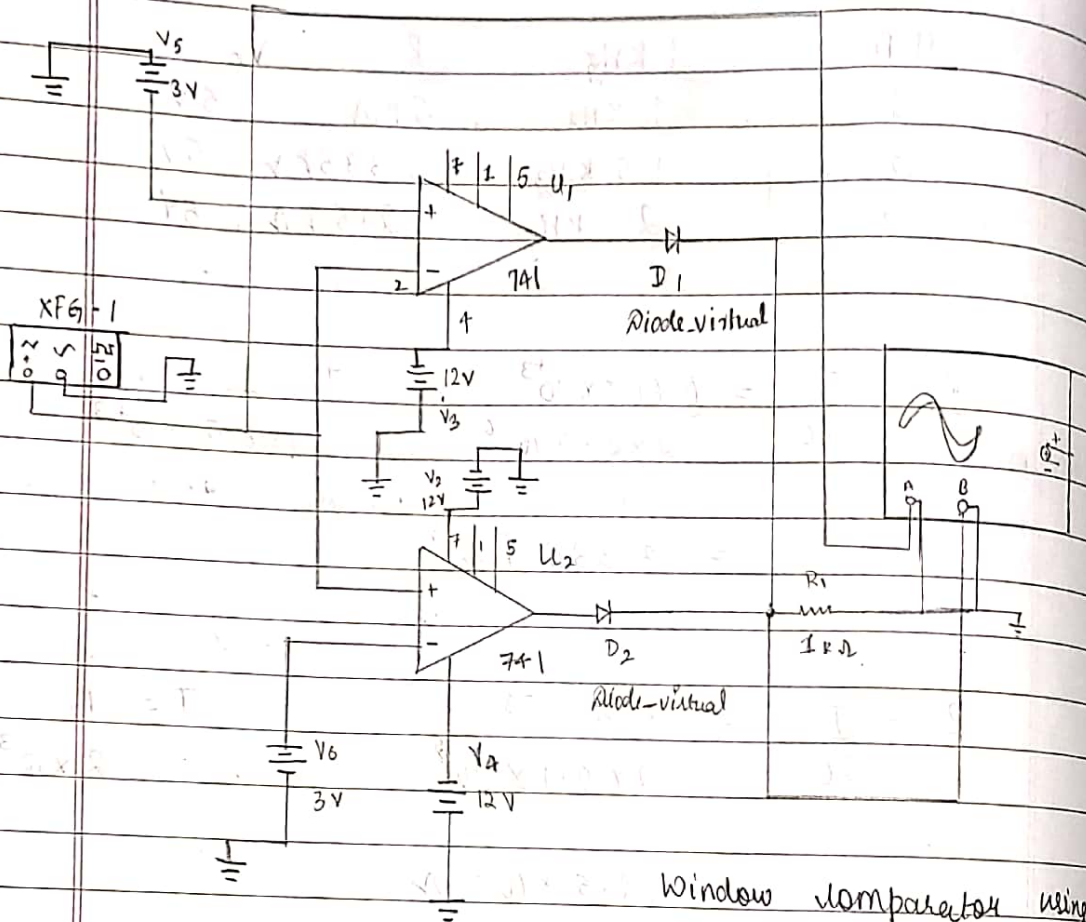
Output waveform



Output waveform

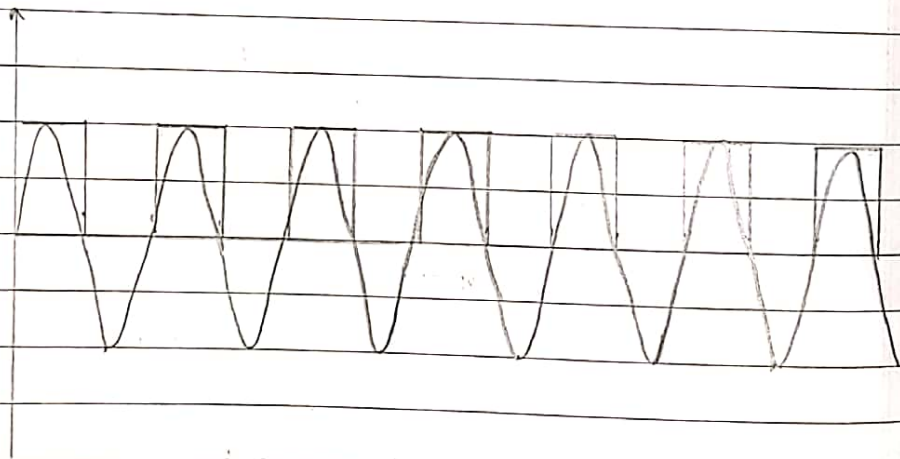


Analogy : Using 741 Opamp, design window comparator for any given VTP and LTP, and simulate the same.



Window comparator using Multisim

Input  
Output  
Characteristics



Transfer  
characteristics

