

Name: \_Muhammad Hashim Butt\_

EE-272L Digital Systems Design

Reg. No.: \_\_\_\_\_2023-EE-27\_\_\_\_\_

Marks Obtained: \_\_\_\_\_

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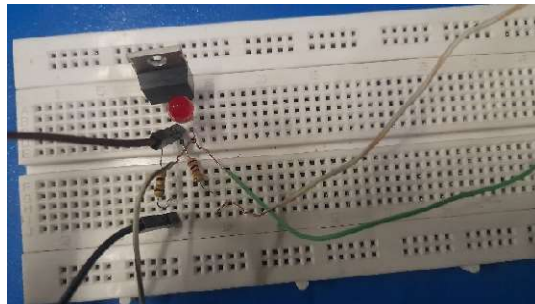
**Lab Manual****DSD Lab Manual Evaluation Rubrics**

Assessment	Total Marks	Marks Obtained	0-30%	30-60%	70-100%
Code Organization (CLO1)	3		No Proper Indentation and descriptive naming, no code organization.  Zero to Some understanding but not working	Proper Indentation or descriptive naming or code organization.  Mild to Complete understanding but not working	Proper Indentation and descriptive naming, code organization.  Complete understanding, and proper working
Simulation (CLO2)	5		Simulation not done or incorrect, without any understanding of waveforms	Working simulation with errors, don't cares's(x) and high impedance(z), partial understanding of waveforms	Working simulation without any errors, etc and complete understanding of waveforms
FPGA (CLO2)	2		Not implemented on FPGA and questions related to synthesis and implementation not answered.	Correctly Implemented on FPGA or questions related to synthesis and implementation answered.	Correctly Implemented on FPGA and questions related to synthesis and implementation answered.

## Experiment 1:

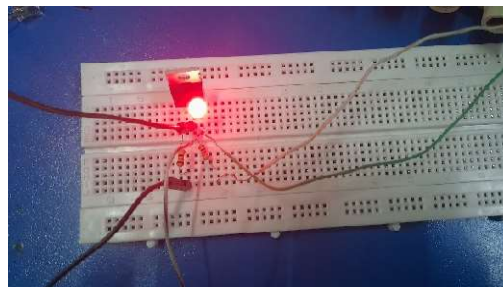
**Task 1:** Apply 5V at terminal A, what is the voltage at terminal B? Does the LED glow?

**Answer:** No, the Led does not glow.



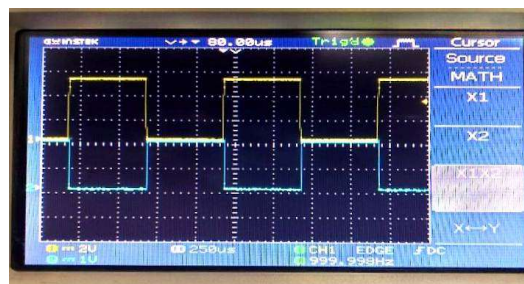
**Task 2:** Apply 0V at terminal A, what is the voltage at terminal B? Does the LED glow?

**Answer:** Yes, the Led does glow.

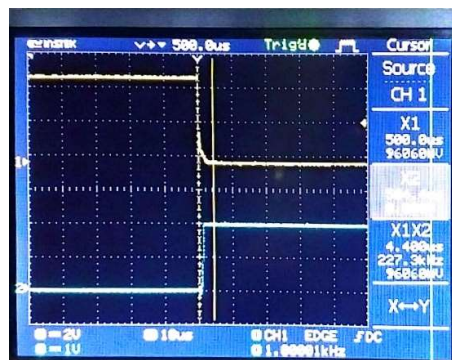


## Task 3: At 1kHz and 5Vp

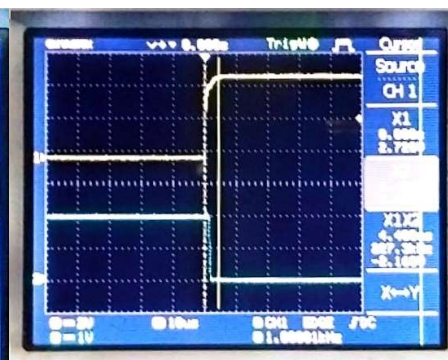
**Answer:** When moving towards higher voltage, the propagation delay is noted to be around  $4.488\mu\text{s}$ . When moving in the opposite direction (Higher to Lower) propagation delay is  $4.400\mu\text{s}$ .



Overall graph: 1kHz



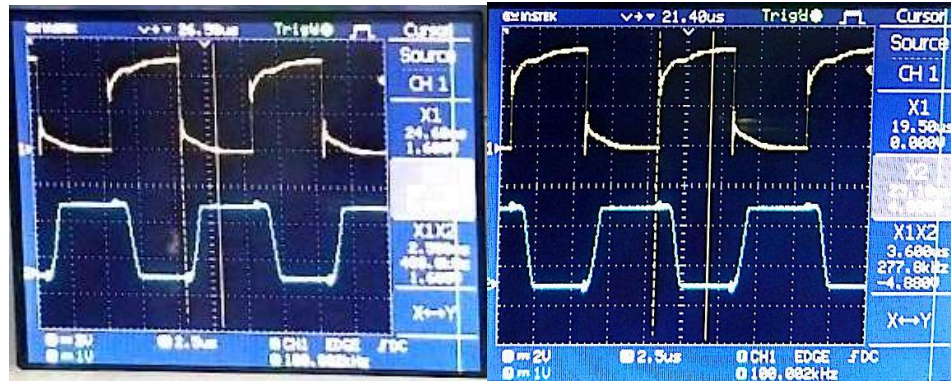
Fall: 1kHz



Rise: 1kHz

#### Task 4: At 100kHz, 5Vp

**Answer:** When moving towards higher voltage, the propagation delay is noted to be around **3.600 $\mu$ s**. When moving in the opposite direction (Higher to Lower) propagation delay is **2.500 $\mu$ s**.



**Fall: 100kHz**

**Rise: 100kHz**

#### Task 5:

As frequency increases, the transistor's performance is affected by parasitic capacitances, reducing gain and slowing switching speed. At lower frequencies, it operates normally, but at higher frequencies, capacitance effects cause delays.