INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad – 500 043

LABORATORY WORK SHEET

Date: 14:06:2021

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Exp No: 10 Experiment Name: Transistor as a switch

DAY TO DAY EVALUATION:

	Preparation	Algorithm / Performance in the Lab	Source Code / Calculations and Graphs	Program Execution / Results and Error Analysis	Viva	Total
Max. Marks	4	4	4	4	4	20
Obtained	4	3	4	4	4	19

Signature of Lab I/C

START WRITING FROM HERE:

Aim:- To study and observe the switching characteristics of a transistor.

Apparatus:-

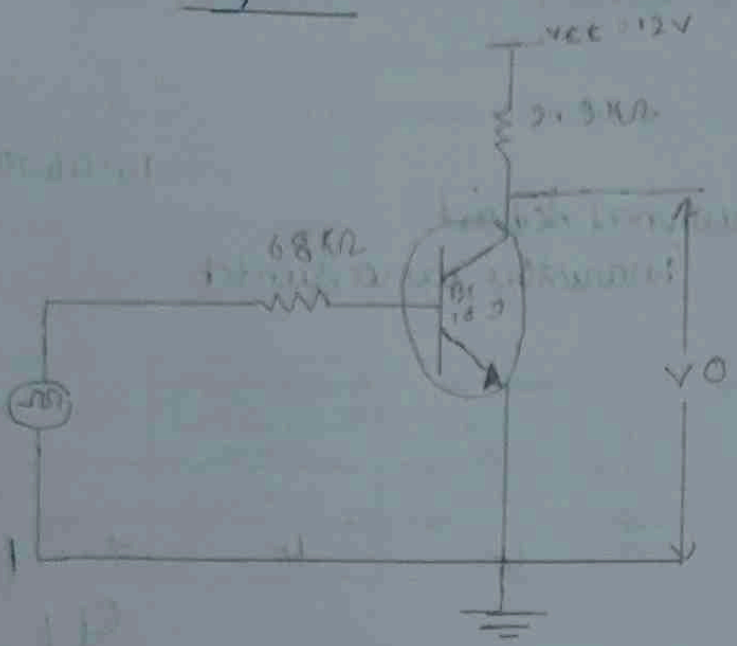
1. Resistor
2. Transistor
3. Breadboard
4. Digilent analog discovery kit with PC
5. connecting wires

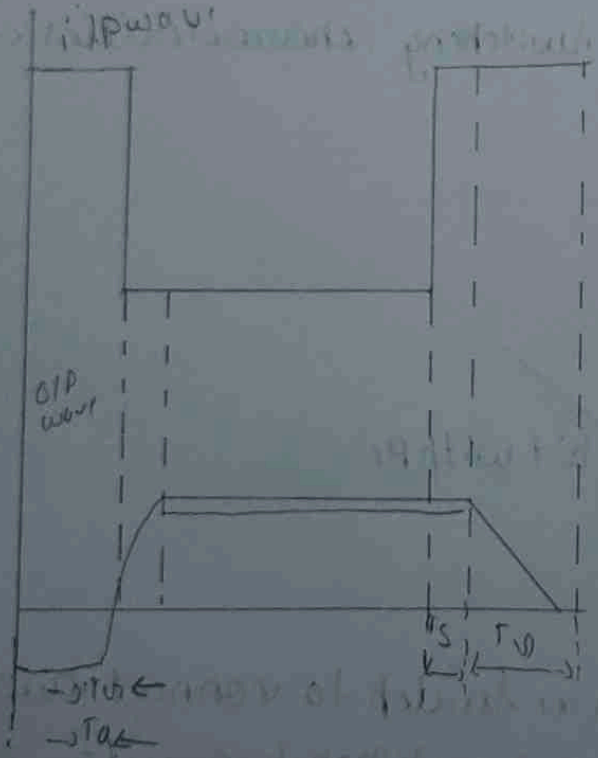
Theory:-

The transistor can be used as a switch to connect and disconnect load R_L from source V_{CC}. When transistor is saturated, it is like a closed switch from collector to the emitter. When a transistor is cutoff it is like an open switch $V_{CE} = V_{CC}$

Procedure:-

circuit diagram





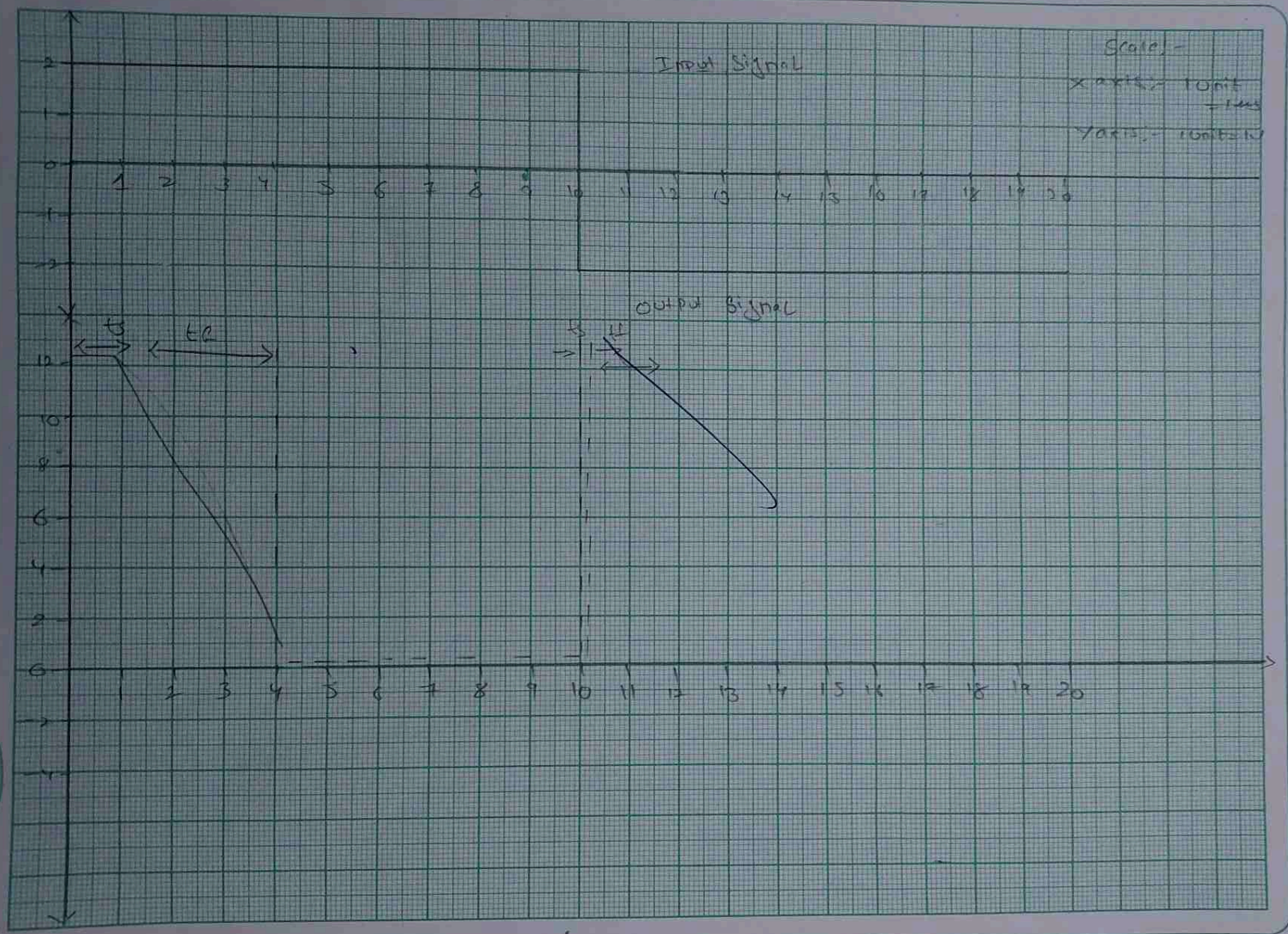
$T_{ON} + T_{OFF}$

1. connect the circuit as shown in figure
2. Switch on the power supply and observe the output of the function generator on CRO.
3. Adjust input signal amplitude such that output signal peak to peak value is less than the saturation level.
4. observe output waveform on CRO and note down the readings.
5. plot the graph between input and output waveforms at given input frequency.

Calculations

rising edge constant = 226.9ns
rising edge = 1.024 us
constant = 8.017 us
Falling edge constant : 8.49ns
Falling edge : 3.423 us.

Result:- Study and observe the switching characteristics of a diode.


Input Signal
Scale:-
x axis:- 1 unit = 1 ms
y axis:- 1 unit = 1V
Output Signal
td
tr
td
tf