# LAB - 6

## BJT inverter

**Exercise A to C is in LTSpice and D is hardware implementation of it.**

A. Implement a BJT inverter circuit explained in section 5.10 of your text book. Plot the VTC as shown in diagram 5.75 for an input varying from 0 to 5V. In addition, for a steady input fill up the following table.

| $V_{IN}$ (V) | $V_E$ | $V_B$ | $V_C$ | Mode of operation |
|---|---|---|---|---|
| 0 | | | | |
| 0.5 | | | | |
| 0.7 | | | | |
| 1 | | | | |
| 1.5 | | | | |
| 2 | | | | |
| 2.5 | | | | |
| 3 | | | | |
| 3.5 | | | | |
| 4 | | | | |
| 4.5 | | | | |
| 5 | | | | |

B. Change the value of $R_B$ and $R_C$ while keeping one value constant as given ( in section 5.10) and observe the change in VTC. Prove the behavior by using the inverter equations.

C. Further extend it to a NOR gate as in example 5.171. On similar line implement NAND gate. Plot truth table for the same.

D. Implement the above exercise in hardware using different registers value given to you in addition to 1 K and 10 K ohms. Plot the truth table of it.