MPHY CC-12 — (P.G. Sem. III)

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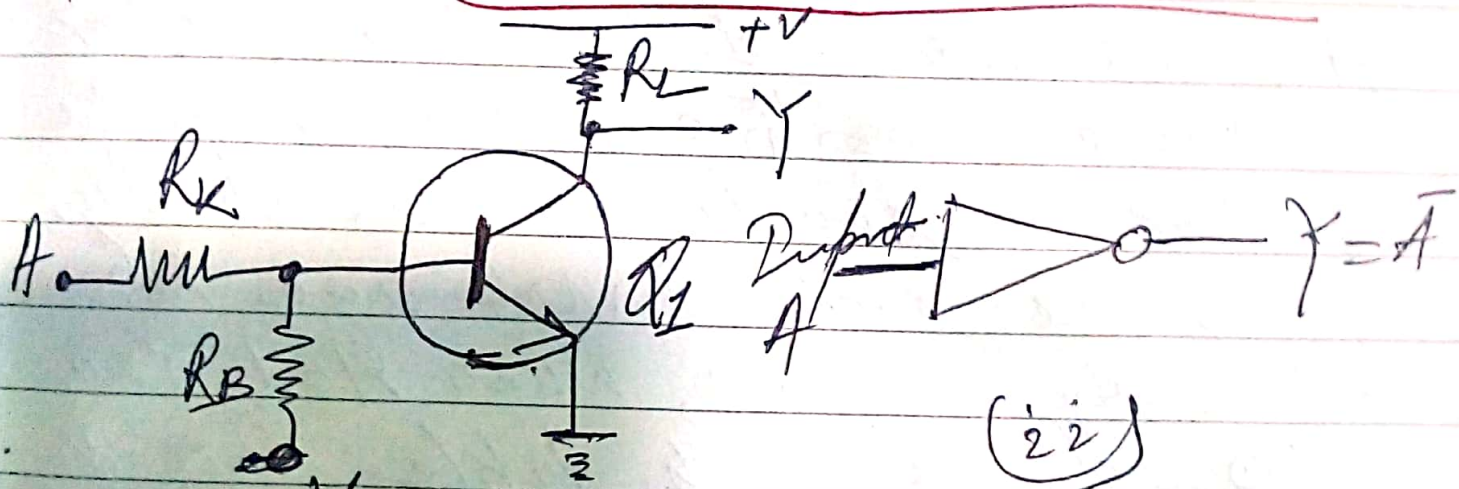
NOT Gate or Inverter



(i) (ii)

A	Y
0	1
1	0

(iii)

Fig. (D)

The NOT gate or inverter is the simplest of all logic gates. It has only one input and one output; here the output is opposite of the input. The NOT gate is often called inverter.

Please turn Over (P.T.O.)

Fig. 1 (i) shows a typical inverter circuit. When A is connected to ground, the base of transistor Q_1 will become negative. This negative potential causes the transistor Q_1 will become negative. This negative potential causes the transistor to cut off and collector current is zero and output is +V volts. In binary terms, when A=0, Y=1. If sufficiently large positive voltage is applied at A, the base of the transistor will become positive, causing the transistor to conduct heavily. Therefore, the output voltage is zero. In binary terms, when A=1, Y=0.

Fig. 1 (ii) shows truth table for an inverter. It is clear from the truth table that whatever the input to the inverter, the output assumes opposite polarity. If the input is 0 the output will be 1; if the input is 1 the output will be 0.

Fig. 1 (ii) shows the logic symbol for NOT gate or inverter. The small bubble on the inverter symbol represents inversion. The Boolean expression for NOT function is

$$Y = \bar{A}$$

Teacher's Signature

Above the bar above the input A represents inversion.

If $A=0$, then $Y=\overline{0}$ or $Y=1$.

If $A=1$, then $Y=\overline{1}$ or $Y=0$.

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