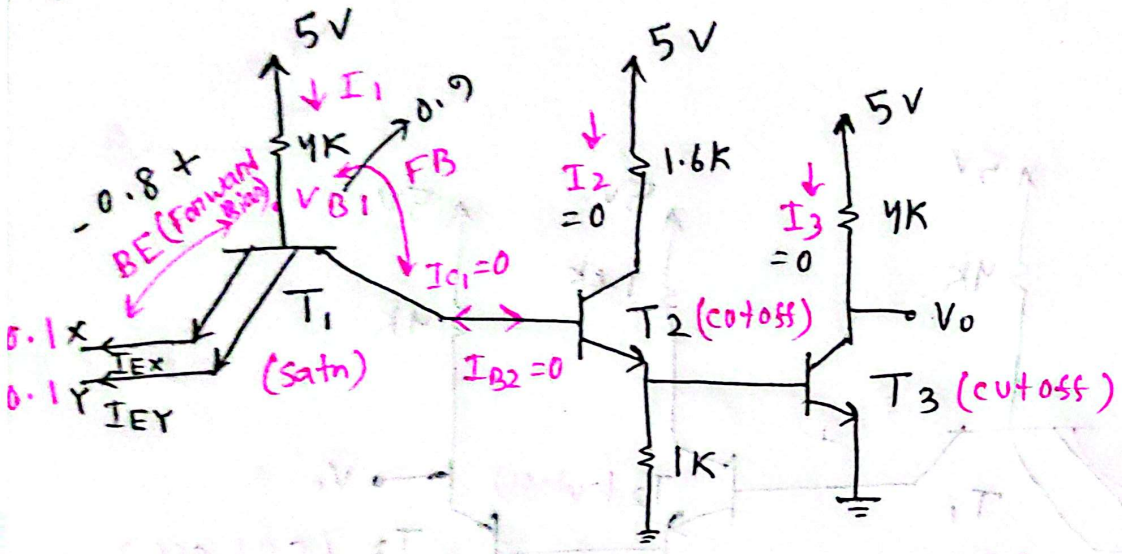
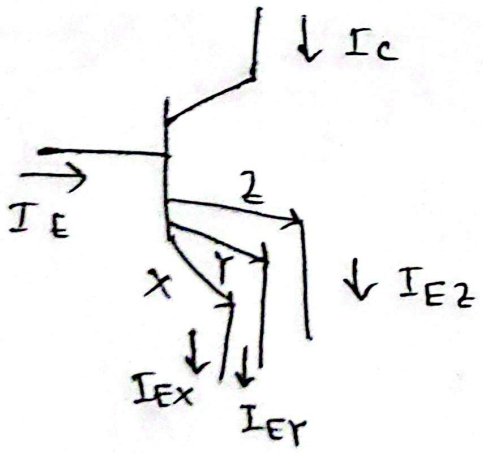



| $V_X$ | $V_Y$ | $V_0$ |
|---|---|---|
| 5 | 5 | Low |
| 0 | 5 | High |
| 5 | 0 | High |
| 0 | 0 | High |

$V_{BE} = 0.8\ V$

## Multi - Emitter Transistor




$$\alpha = \frac{I_C}{I_E}$$

$$\alpha = \frac{I_C}{I_{EX}} = \frac{I_C}{I_{EY}} = \frac{I_C}{I_{EZ}}$$

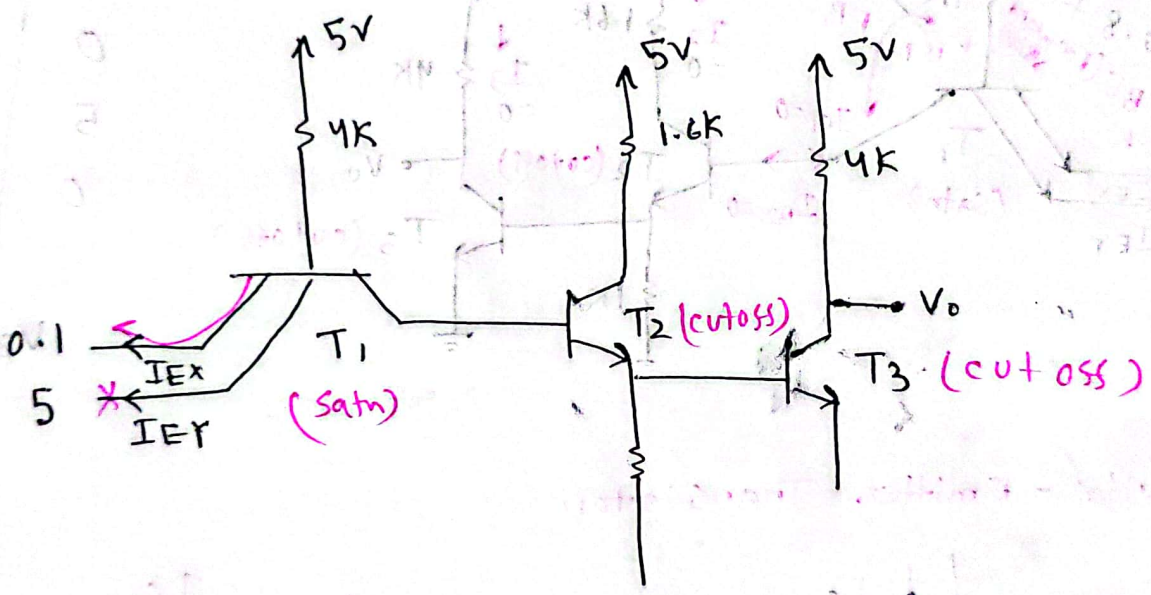
$$I_1 = \frac{5 - 0.9}{4} = 1.025 \text{ mA} = I_{B1}$$

$$\beta_{forced} = \frac{I_{C1}}{I_{B1}} = 0 < \beta_F$$

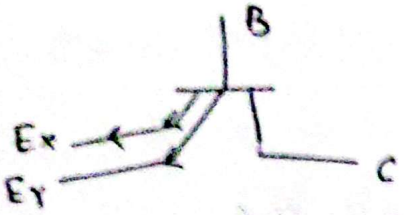
$T_1$ is in saturation.

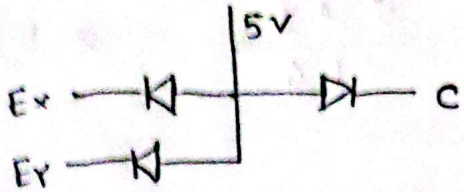
$$I_{EX} = I_{EY} = \frac{I_B}{2} = \frac{I_1}{2} = 0.5125 \text{ mA}$$

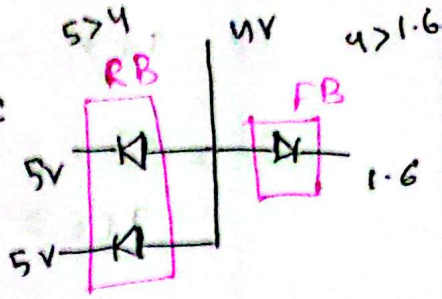
$$P_{dis} = (5 - 0.9) I_1 + (0.9 - 0.1) I_{EX} \times 2$$



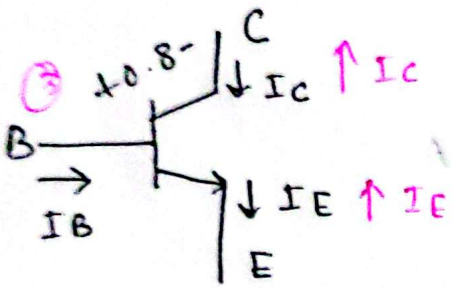
TOPIC NAME _____ DAY _____ TIME: DATE: / /



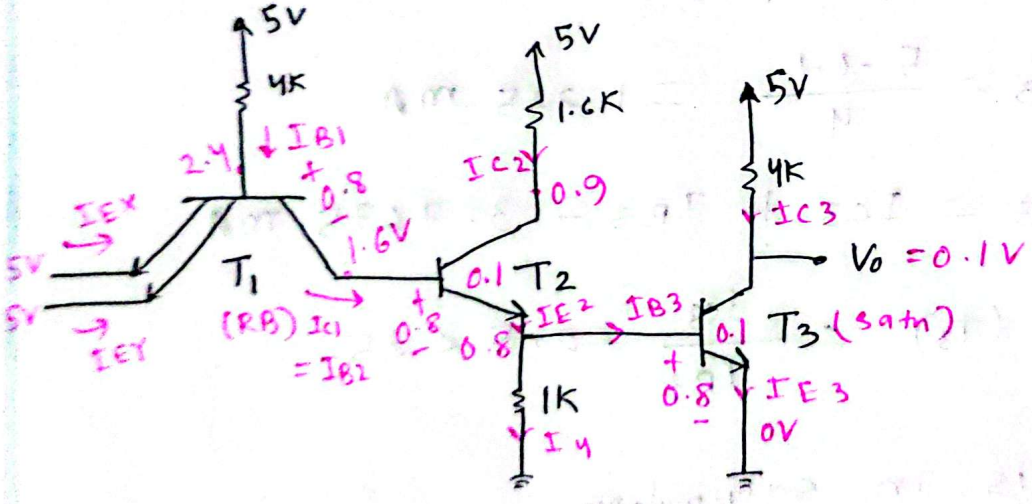




| BE Junc | BC Junc | |
|---|---|---|
| R.B | F.B | (Reverse Active) |




① $\beta_R = \frac{I_E}{I_B}$

② $I_C = I_E + I_B$




$\beta_F = 25V$

$\beta_R = 0.1$

$V_{CE} = 0.1V$

$V_{BE} = 0.8V$

$$I_{B1} = \frac{5 - 2.4}{4} = 0.65 \text{ mA}$$

$$\beta_R = \frac{I_{EX}}{I_{B1}} \qquad \therefore I_{EX} = I_{EY} = 0.065 \text{ mA}$$

$$I_{C1} = I_{B2} = I_{EX} + I_{EY} + I_{B1} = 0.78 \text{ mA}$$

GOOD LUCK

$$I_{C2} = \frac{5 - 0.9}{1.6} = 2.56 \text{ mA}$$

$$I_{E2} = I_{C2} + I_{B2} = 3.3425 \text{ mA}$$

$T_2$ :

$$\beta_{\text{sonce}} = \frac{2.56}{0.78} = 3.28 < 25$$

$T_2$ is in saturation.

$$I_4 = \frac{0.8 - 0}{1} = 0.8 \text{ mA}$$

$$I_{E2} = I_{B3} + I_4$$

$$I_{B3} = 2.5425 \text{ mA}$$

$$I_{C3} = \frac{5 - 0.1}{4} = 1.225 \text{ mA}$$

$$I_{E3} = I_{C3} + I_{B3} = 3.7675 \text{ mA}$$

$$\beta_{\text{sonce}} (T_3) = \frac{I_{C3}}{I_{B3}} = 0.5 < 25$$

$T_3$ is in saturation.

TOPIC NAME : _____ DAY : _____

TIME : DATE : / /

$$P_{dis} = (5 - 2.4)\, I_{B1} + (5 - 2.4) \times I_{Ex} \times 2$$
$$+ (2.4 - 1.6)\, I_{B1} + (1.6 - 0.8)\, I_{B2}$$
$$+ (0.8 - 0)\, I_4 + (5 - 0.9)\, I_{C2}$$
$$+ (5 - 0)\, I_{C3} + (0.8 - 0)\, I_{B3} + (0.9 - 0.8)\, I_{C2}$$