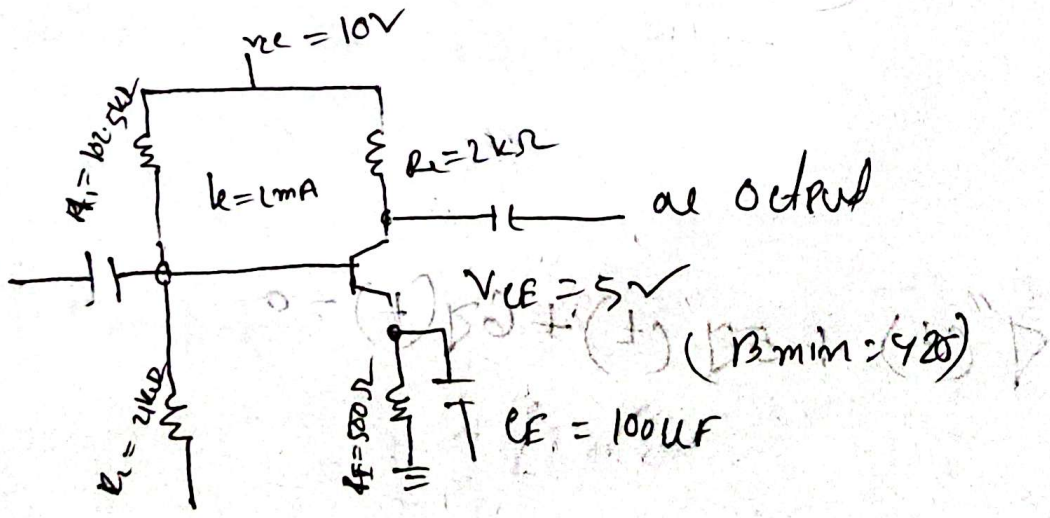
ID: 2023200000769

Sum = 7+6+9 = 22 ; BJT model => BC547C

$V_{cc} = 2V_{EE} = 10$

$I_e = 2.0\,mA$; $V_{EE} = 5.0V$; $\beta(min) = 420$

$I_B = I_C/\beta = \frac{2\,mA}{420} = 4.76 \times 10^{-3}$



$V_E = 1/10\ V_{cc} = 1/10 \times 10 = 1V$

$R_E = V_E/I_E = V_E/I_e = 1/2 \times 10^{-3}$

$= 500\ \Omega$

$V_{RE} = V_{cc} - V_{EE} - V_E = 10 - 5 - 1 = 4V$

$$\therefore R_C = \frac{V_{RC}}{I_C} = \frac{4}{2\times10^{-3}} = 2000\,\Omega = 2\,k\Omega$$

$$V_B = V_{BE} + V_E = 0.7 + 1$$
$$= 1.7\,V$$

$$V_B = \frac{R_2}{R_1 + R_2} V_{cc}$$

$$= \frac{21}{R_1 + 21} \times 10$$

$$R_1 = 102.5\,k\Omega$$

$$R_e \leq 1/10\,\beta R_E$$

$$R_2 \leq 1/10 \times 420 \times 500$$

$$R_2 = 21\,k\Omega$$

now $r_e = \frac{26mV}{I_E} = \frac{26mV}{I_C} = \frac{26mV}{2\,mA}$

$$= 13\,\Omega$$

input impedence $Z_{in} = R_1 \| R_2 \| \beta r_e$

$$= \left(1/102.5 + 1/21 + 1/\beta(13\times10^{-2})\right)$$

$$\Rightarrow 4.157\,k\Omega$$

out put impedence = Re || ro (ro∞)

$= (1/Re + 1/ro)$

$= (1/Re + 1/ro)^{-1}$

$= (1/Re)^{-1}$

$= Re = 2k\Omega$

Input AC V= $(4+5+9) \div 3 = 6V$

Assignment-02

mine is even

model no SRD-09 VDE-SL-C

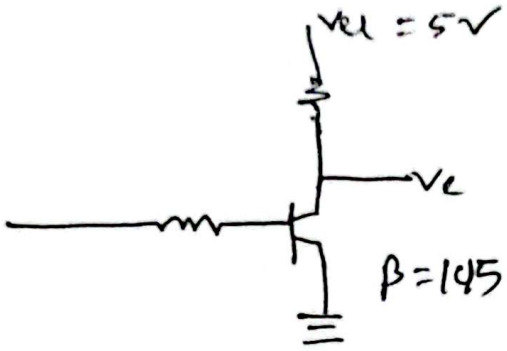
9V

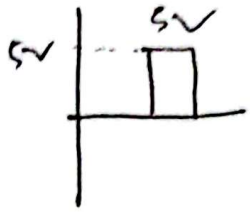
here

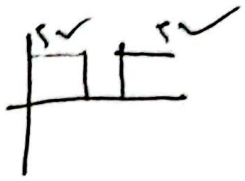
Icut = 50 mA

using BC637 BJT

for 50 mA, $\beta = 145$





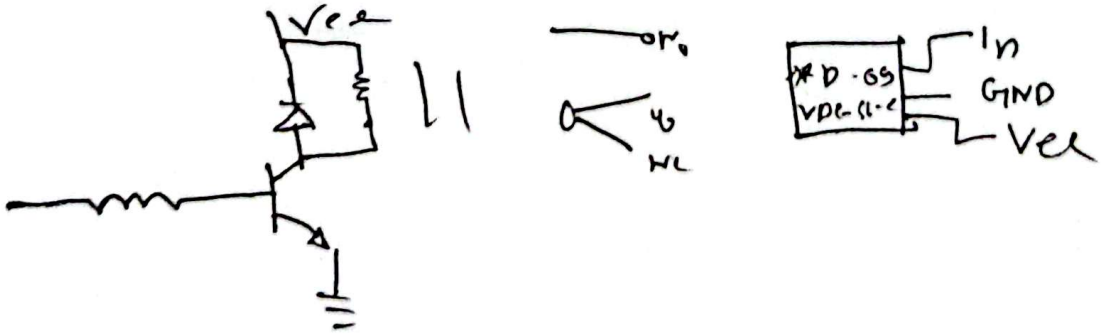


$$I_B \geq \frac{I_{load}}{\beta}$$

$$I_B \geq 0.34\ mA$$

If $I_B = 0.689\ mA$

$$R_B = \frac{V+0.7}{I_B} = \frac{5-0.7}{0.689} = 6.24\ K\Omega$$



Relay driver