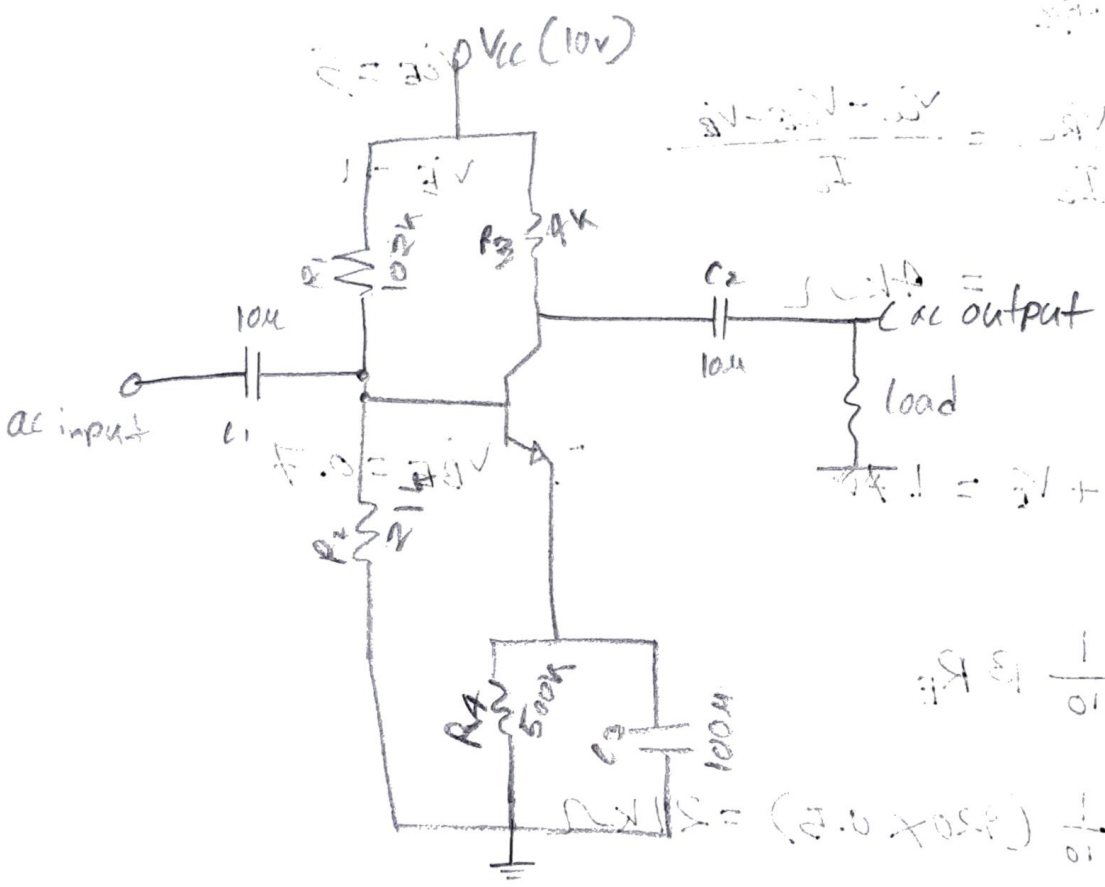
Calculation

Last 3 digit of ID is 327 = 12. Thath why i use BC547C.



From Datasheet $I_C = 2mA$, $V_{CE} = 5v$, $V_{CC} = 10v$; $\beta = 420$

$$V_E = \frac{1}{10} V_{cc} = 1v$$

$$R_E = \frac{V_E}{I_{E/C}} = 500\Omega$$

$$R_C = \frac{V_{RC}}{I_C} = \frac{V_{cc} - V_{CE} - V_E}{I_C}$$

$$= 4k\Omega$$

Where

$V_{cc} = 10\,V$

$V_{CE} = 5$

$V_E = 1$

$$V_B = V_{BE} + V_E = 1.7v \qquad \because V_{BE} = 0.7$$

$$R_2 = \frac{1}{10} \beta R_E$$

$$= \frac{1}{10} (920 \times 0.5) = 21k\Omega$$

$$V_B = \frac{R_2}{R_2 + R_1} V_{cc} \quad \text{[Voltage divider rule]}$$

$$\text{to } 1.7v \cdot \frac{(21k\Omega)}{R_1 + 21k\Omega} 10V$$

$\therefore R_1 = 102k\Omega$

$\because R_E = 500k\Omega$

$R_C = 4k\Omega$

$R_1 = 102k\Omega$

$R_2 = 21k\Omega.$