

# Electronics Analog / Lista CA

## Imac de Freitas

01)  $f = 100 \text{ Hz} \sim 200 \text{ Hz} / C = ?$

$$X_C = \frac{1}{2\pi f C} \Rightarrow 4 \text{ K} = \frac{1}{2\pi \cdot 100 \cdot C} \Rightarrow 4 \text{ K} = \frac{1}{628,32 C} \Rightarrow \boxed{C = 3,98 \mu\text{F}}$$

02)  $f = 500 \text{ Hz} \sim 1 \text{ MHz} / C = ?$

Req:  $10 // 10 // 30 = 4,3 \text{ K} \Rightarrow 50 \text{ K} = \frac{1}{2\pi \cdot 500 C} \Rightarrow C = \frac{1}{2\pi \cdot 500 \cdot 4,3 \text{ K}}$

$$\boxed{C = 181,9 \mu\text{F}}$$

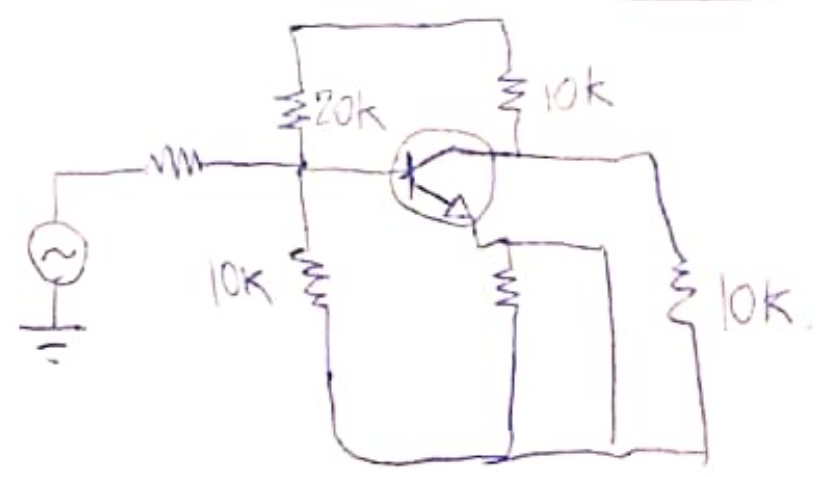
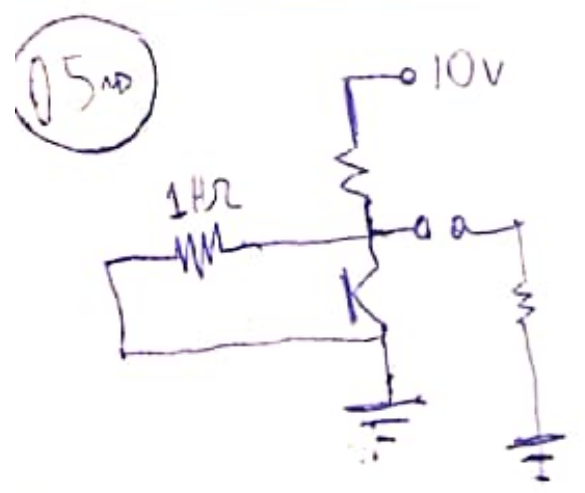
$$C = 181,9 \mu F$$

13nd  $f = 20 \text{ Hz} / C = ?$

$$500 // 10K = 476,2 \Omega \Rightarrow C = \frac{1}{2\pi \cdot 20 \cdot 476,2} \Rightarrow C = 167,2 \mu F$$

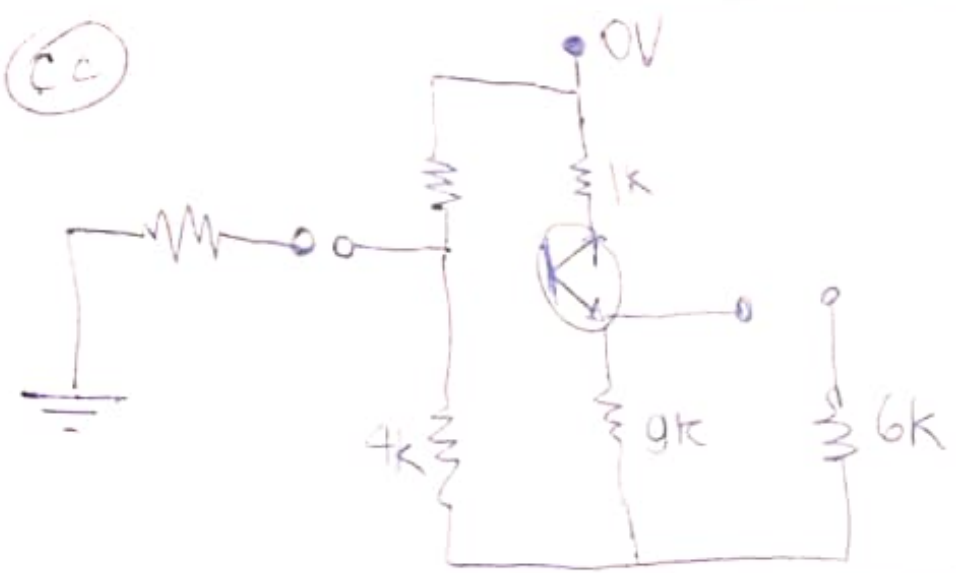
14nd  $f = 10 \text{ Hz} \sim 200 \text{ kHz} / C = ?$

$$1K // 4K = 0,8K \Rightarrow C = \frac{1}{2\pi \cdot 10 \cdot 0,8K} \Rightarrow C = 198,9 \mu F$$

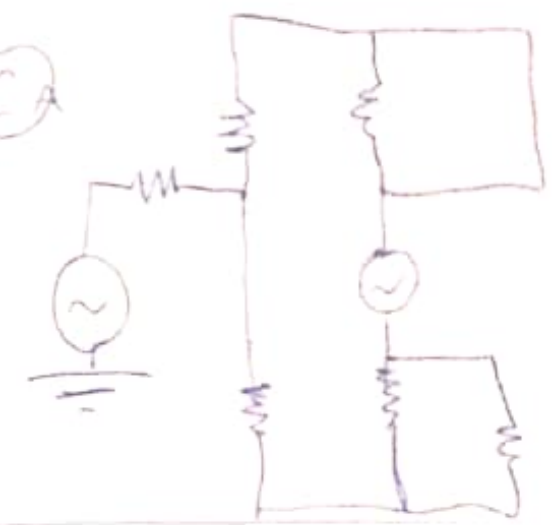


06w

CC

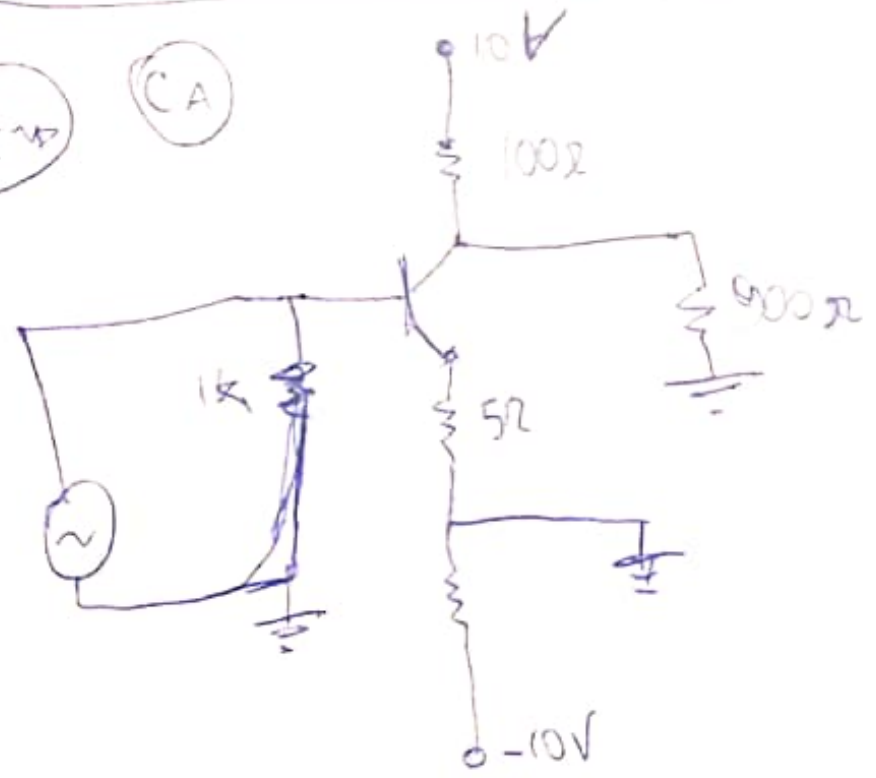


CA

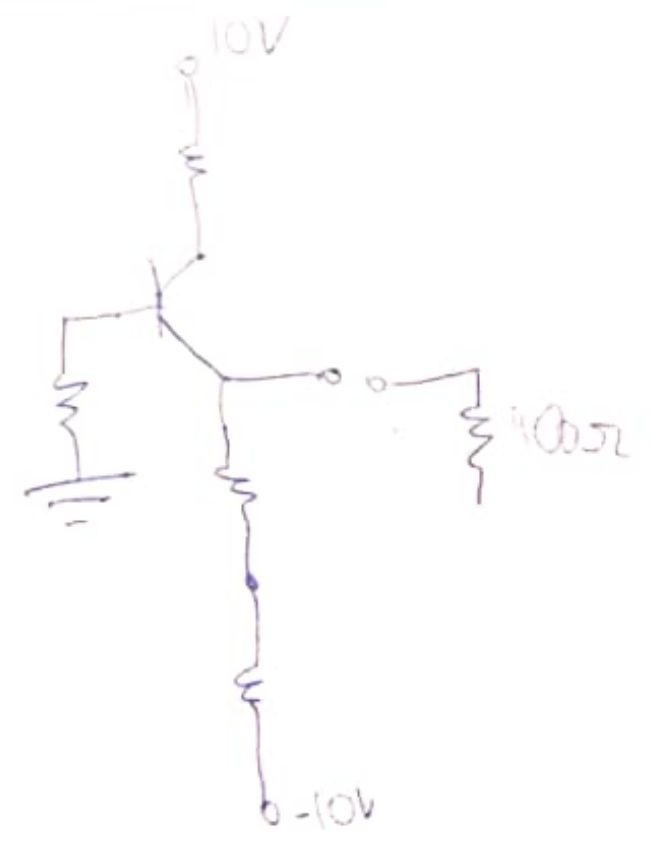


07w

CA



CC



08-17  $V_e = ?$

$$r_e = \frac{25 \text{ mV}}{I_e}$$

$$Z_b \Rightarrow \frac{10 \text{ k}}{30 \text{ k}} \cdot 30 = 10 \text{ V}$$

$$I_e = \frac{10 - 0,7}{10 \text{ k}} = 0,03$$

$$r_e = \frac{25 \text{ mV}}{0,03 \text{ mA}} = 26,88 \Omega$$

$$Z_c \Rightarrow \frac{1 \text{ k}}{5 \text{ k}} \cdot 10 = 2 \text{ V}$$

$$I_e = \frac{1,3}{1 \text{ k}} = 1,3 \text{ mA}$$

$$r_e = \frac{25 \text{ mV}}{1,3 \text{ mA}} = 19,23 \Omega$$

09m

$$\beta_{ac} = \frac{I_C}{I_B} =$$

$$100 I_B = I_C$$

$$100 I_B = (10K \cdot I_C) - 10$$

$$r'_e = 53,126 \Omega$$



$$(10) r'_e = \frac{25 \text{ mV}}{1,05 \text{ mA}} = 23,8 \Omega$$

$$M_c = 6,2 \text{ K}$$

$$\Delta v = \frac{-6,2 \text{ K}}{23,8} = -260,5$$

$$V_{10K} = \frac{10K}{66K} \cdot 15 = 2,27 \text{ V}$$

$$I_e = \frac{2,27 \cdot 0,7}{1,5} = 1,05 \text{ mA}$$

$$V_{SAIDA} = 260,5 \cdot 1 \text{ mV} = 260,5 \text{ mV}$$

$$(13) V_e = \frac{30 \cdot 10K}{30K} \cdot 0,7 = 9,3 \text{ V}$$

$$I_e = \frac{9,3}{10K} = 9,3 \cdot 10^{-4} \text{ A}$$

$$r'_e = \frac{25 \text{ mV}}{9,3 \cdot 10^{-4}} = 26,88 \Omega$$

$$Z_{in} = 10K // 20K // 26,88 = 2,2 \text{ K}$$

$$V_{in} = \frac{5 \cdot 2,2 \text{ K}}{26,8} = 3,43 \text{ mV}$$

$$\Delta v = \frac{3K}{26,8} = -187,3$$

$$V_{SAIDA} = -187,3 \cdot 3,43 \text{ mV} = 642,44 \text{ mV}$$

$$66K$$

$$I_e = \frac{2,27 \cdot 0,7}{1,5} = 1,05mA$$

$$V_{SAIDA} = 260,5 \cdot 1mV = -260,5mV$$

$$V_{in} = \frac{5 \cdot 2,2K}{26,8} = 3,43$$

$$\Delta v = \frac{3K}{26,8} = -187,3$$

$$V_{SAIDA} = -187,3 \cdot 3,43 = -642,44m$$

$$⑤ V_e = 9,3v$$

$$I_e = \frac{9,3}{10K + 100} = 9,2 \cdot 10^{-4}A$$

$$Z_{in} = 10K // 20K // 242K$$

$$Z_{in} = 5,08K$$

$$\Delta v = \frac{-5K}{127,17} = -39,3$$

$$R'_e = \frac{25mV}{9,2 \cdot 10^{-4}} = 27,17\Omega$$

$$V_{in} = \frac{5 \cdot 5,08K}{5,08K + 1K} = 8,3510$$

$$V_{SAIDA} = -39 \cdot 8,35 \cdot 10^{-3} = -32,8mV //$$

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