

2006 SZÉTV elektronika- elektrotechnika elődöntő

Tesztjellegű kérdések

1. $U^2 = P * R$

U	2	3	6	12	18
P	0,4	0,9	3,6	14,4	32,4

2. $R' = R * (1 + \alpha * \Delta T) = \underline{\underline{84 \Omega}}$

3. $C = \epsilon \frac{A}{d}$

d	0,1	0,2	0,4	0,8	1,6
C	320	160	80	40	20

4. $U = U_{cs} * \sin(2\pi ft) = \underline{\underline{100,2 V}}$

5. $I = \frac{U}{2\pi fL}$

f	50	100	200	400	600
I	480	240	120	60	40

6. $G = 1/R; B = 1/X_C; Y = \sqrt{G^2 + B^2}; Z = 1/Y = \underline{\underline{2,4 k\Omega}}$

7. $R = \frac{U - U_{AK}}{I_A} = \underline{\underline{330 \Omega}}$

8. $S = \frac{h_{21}}{h_{11}} = \underline{\underline{50 mS}}$

9. $A_I = \frac{i_{ki}}{i_{be}} = \frac{u_{ki}}{u_{be}} * \frac{R_{be}}{R_t} = \underline{\underline{-80}}$

10. $U_{be} = U_g * \frac{R_{be}}{R_g + R_{be}} = \underline{\underline{25 mV}}$

11. = 3D7B16

12. $F^4 = (\overline{A+B+C+D}) * (A+\overline{B+C+D}) * (A+\overline{B+C+D}) * (A+B+C+D)$

Összetett feladatok

1.a. $R_b = (R_1 \times R_2 + R_3) \times R_4 = \underline{100 \Omega}$

$$U_2 = U \times \frac{R_2 \times (R_3 + R_4)}{R_1 + R_2 \times (R_3 + R_4)} = 12 \text{ V}$$

$$U_0 = U_2 \times \frac{R_4}{R_3 + R_4} = \underline{8 \text{ V}}$$

b. $U_b = I_b \times R_b$; $I_b = \underline{80 \text{ mA}}$

2.a. $f_0 = \frac{1}{2\pi\sqrt{LC}}$; $L = \underline{2,5 \text{ mH}}$

b. $X_L = 2\pi fL = 1,57 \text{ k}\Omega$; $Q = \frac{X}{L} = 78,5$;

$$B = \frac{f_0}{Q} = 1273,9 \frac{1}{\text{s}}$$

c. $Z = r = 20 \Omega$

$$I = \frac{U}{Z} = 25 \text{ mA}$$

$$U_L = U_C = I \times X = \underline{39,78 \text{ V}}$$

d. $B = \frac{f_0}{X} \times R$;

$$R = \frac{B \times X}{f_0} = 318 \Omega$$

$$R' = R - r = \underline{298 \Omega}$$

3. $R_{C1} = \frac{U_t - U_{CE1}}{I_{C1} - I_{B2}} = \underline{7,55 \text{ k}\Omega}$

$$I_{B1} = I_{C1} = 5 \mu\text{A}$$

$$R_{B1} = \frac{U_{BE1}}{10 I_{B1}} = \underline{12 \text{ k}\Omega}$$

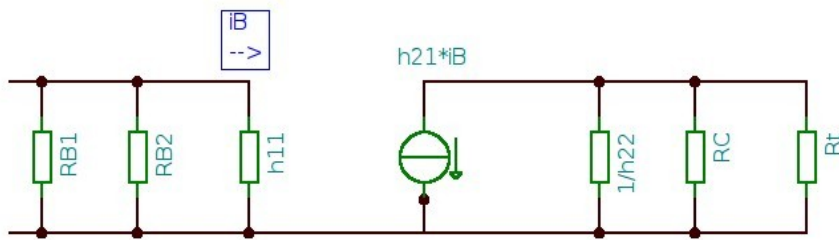
$$I_{B2} = \frac{I_{C2}}{B_2} = 20 \mu\text{A}$$

$$= \underline{988 \Omega}$$

$$R_{B2} = \frac{U_{BE1} - U_{CE1} + U_{BE2}}{9 I_{B1}} = \underline{31,1 \text{ k}\Omega}$$

$$R_{C2} = \frac{U_t - U_{CE2} \cdot (E_{CE1} - U_{BE2})}{I_{CE2}} = \underline{2 \text{ k}\Omega}$$

4.



- a. $R_{be} = R_{B1} \times R_{B2} \times h_{11} = \underline{2,78 \text{ k}\Omega}$
 $R_{ki} = R_C \times \frac{1}{h_{22}} = \underline{3,05 \text{ kW}}$
- b. $A_U = \frac{U_{ki}}{U_{be}} = \frac{h_{21} \cdot i_B \cdot R_{ki} \times R_t}{i_B \cdot h_{11}} = \underline{-94,7}$
 $A_i = -A_u \cdot \frac{R_{br}}{R_t} = \underline{52,7}$
- c. $U_{be} = U_g \cdot \frac{R_{be}}{R_{be} + R_g} = \underline{7,35 \text{ mV}}$
- d. $f_{a2} = \frac{1}{2 \pi C \cdot (R_4 + R_t)} = \underline{4,2 \text{ kHz}}$