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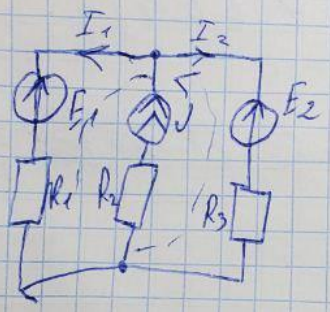

№1

$R_{ит} = 60\ [Ом]$

$J = 4\ [A]$

$E_1 = E_2 = 180\ [В]$

$p^* = 3$

$p_{ит} = 1$

$p = p^* - p_{ит} = 3 - 1 = 2$

$q = 2$

$n = p - (q-1) = 2 - (2-1) = 1$

$m_I = q - 1 = 1$

$m_{II} = n = 1$

$$\begin{cases} 3k\ I.1: & J - I_1 - I_2 = 0 \Rightarrow J = I_1 + I_2 \\ 3k\ II.1: & R_1 I_1 - R_3 I_2 = E_1 - E_2 \end{cases}$$

$$\begin{cases} 4 = I_1 + I_2 \\ 60(I_1 - I_2) = 0 \end{cases} \quad \begin{cases} I_1 = 4 - I_2 \\ 4 - 2I_2 = 0 \end{cases} \quad \begin{cases} I_1 = 2\ [A] \\ I_2 = 2\ [A] \end{cases}$$

$P = [redacted] = R_3 \cdot I_3^2$

$P = 60 \cdot 4 = 240\ [Вт]$

№3

$P_{макс} = 28$ [Вт] $\quad r = 7$ [Ом]

$R = 7$ [Ом]

$P_н = R_н \cdot I_н^2 = \frac{E^2}{(R_н + r)^2}$ ~~$U = R \cdot I$~~ $\frac{P}{I}$

~~$\frac{P}{R} = \frac{28}{7}$~~

$P_{ист} = I^2 \cdot r = \frac{E^2 \cdot r}{(R+r)^2} = 28$ [Вт]

$\frac{E^2 \cdot 7}{14^2} = 28$

$E = 28$ [В]

$I = \frac{E}{r+R} = \frac{28}{14} = 2$ [А]

$U = \frac{P}{I} = \frac{28}{2} = 14$ [В]

$P_1 = 28 \cdot 0{,}75 = 21$ [Вт]

$U_1 = \frac{P_1}{I} = \frac{21}{2} = 10{,}5$ [В]

Ответ: 10,5 [В]

№5

$i(t) = 4,5 \cdot \sin(100t + 20^\circ)$ [A]

$R = 5$ [Ом] $L = 50$ [мГн] $= 0,5$ [Гн] $C = 1000$ [мкФ] $= 10^{-3}$ [Ф]

$\underline{I}_m = 4,5 \cdot e^{20^\circ j} = 4,5 \cdot (\cos 20^\circ + i \sin 20^\circ) =$

$= 4,5 \cdot (0,94 + i \cdot 0,342) = 4,23 + 1,539i$ [A]

$\underline{Z}_R = R = 5 = 5 \cdot e^{0j}$ [Ом]

$\underline{Z}_L = X_L \cdot j = \omega \cdot L \cdot j = 100 \cdot 0,5 \cdot j = 50j = 50 \cdot e^{90^\circ j}$ [Ом]

$\underline{Z}_C = -X_C \cdot j = -\left(\frac{1}{\omega C}\right) \cdot j = -\frac{1000}{100} \cdot j = -10j = 10 \cdot e^{-90^\circ j}$ [Ом]

По: $\underline{I}_m = \frac{\underline{U}_{mR}}{\underline{Z}_R}$ $\underline{U}_{mL} = \underline{I}_m \cdot \underline{Z}_L = 21,15 + 7,695i$ [В]

$\underline{U}_{mL} = \underline{I}_m \cdot \underline{Z}_L = -76,95 + 211,5j$ [В]

$\underline{U}_{mC} = \underline{I}_m \cdot \underline{Z}_C = 15,39 - 42,3i$ [В]

$\underline{S}_n = \frac{\underline{U}_{mR} \cdot \underline{I}_m^*}{2} + \frac{\underline{U}_{mL} \cdot \underline{I}_m^*}{2} + \frac{\underline{U}_{mC} \cdot \underline{I}_m^*}{2} =$

$= \left(\frac{(21,15 + 7,695i)^*}{2} + \frac{-76,95 + 211,5j}{2} + \right.$

$+ \frac{15,39 - 42,3j}{2}) \cdot (4,23 - 1,539j) =$

$= 50,654 + 405,228j$

Ответ: $50,654 + 405,228j$

№6

Увеличиться вдвое

№8

В точку С

№9

$I_L = \frac{E}{R+r} = \frac{-90}{30} = -3\ [A]$

$U_C = 0\ [B]$