

תשובות סופיות לבחינת מה"ט בתורת החשמל – קיץ 2022 מועד ב'

שאלה 1

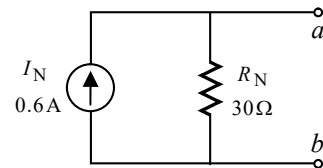
א. $E=120(V)$

ב. $I_{ab} = 2(mA)$ מ-*a* ל-*b*.

ג. $P_E = 0.936(W)$

שאלה 2

א.



ב. $R_L = 30(\Omega)$

ג. $P_{R_L} = 2.7(W)$

שאלה 3

א. $C_X = 4(pF)$

ב. $C_T = 3(pF)$

$W_T = 38.4(nJ)$

ג. $A = 0.677 \times 10^{-3}(m^2)$

שאלה 4

א. 1. $U_x = 80(V)$

$U_y = 0(V)$

2. $U_x = 80(V)$

$U_y = 20(V)$

3. $I_L = 0.4(A)$

ב. 1. $I_{S_2} = 5.55(mA)$

2. $U_x = 80(V)$

$U_y = 80(V)$

3. $I_{S_2} = 0(A)$

שאלה 5

א. $\bar{U}_{ab} = 27.267 \angle -6.287^\circ (V)$

ב. $\bar{I}_{ab} = 1.441 \angle -25.818^\circ (A)$

ג. $R_L = |\bar{Z}_{Th}| = 18.921(\Omega)$

שאלה 6

א. $\omega_{0_1} = 1632.993 \left(\frac{rad}{s}\right)$

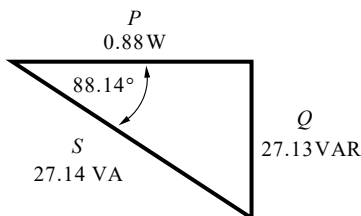
$\omega_{0_2} = 1118.033 \left(\frac{rad}{s}\right)$

$f_{0_1} = 259.898(Hz)$

$f_{0_2} = 177.940(Hz)$

ב. $\bar{I}_T = 0.57 \angle -120^\circ (A)$

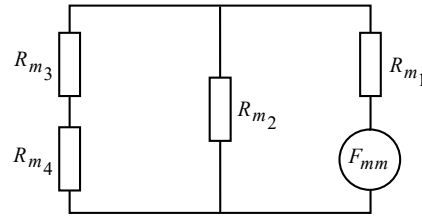
ג.



ד. $\bar{I}_R = 0.296 \angle 68.445^\circ (A)$

שאלה 7

.א



$$R_{m_1} = 240 \times 10^3 \left(\frac{1}{\text{H}} \right)$$

$$R_{m_2} = 160 \times 10^3 \left(\frac{1}{\text{H}} \right)$$

$$R_{m_3} = 237 \times 10^3 \left(\frac{1}{\text{H}} \right)$$

$$R_{m_4} = 5.968 \times 10^6 \left(\frac{1}{\text{H}} \right)$$

$$R_{m_T} = 395.978 \times 10^3 \left(\frac{1}{\text{H}} \right)$$

.ב $L = 0.157(\text{H})$

.ג $\phi_{3-4} = 63.478(\mu \text{Wb})$

$$B_{3-4} = 0.317(\text{T})$$

.ד $\bar{Z} = 5 + j991.718(\Omega)$

שאלה 8

.א $i_{R_1}(t) = 0.279\sqrt{2} \sin(314t - 12.117^\circ) +$

$$+ 0.091\sqrt{2} \sin(628t - 25.464^\circ) + 0.33(\text{A})$$

.ב $I_{R_1(\text{av})} = 0.33(\text{A})$

.ג $I_{R_1(\text{rms})} = 0.444(\text{A})$

.ד $P_{R_1} = 9.873(\text{W})$