Inačica **A**

Završni ispit iz OE
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1. *2 boda*

Impedancije $\underline{Z}_{12} = 10 + j10\ \Omega$, $\underline{Z}_{23} = 10 - j5\sqrt{3}\ \Omega$ i $\underline{Z}_{31} = 5\sqrt{3} - j10\ \Omega$ spojene su u trokut na simetrični trofazni izvor linijskog napona $U_l = 400$ V. Odrediti ukupnu radnu i jalovu snagu.

A) P = 18,8 kW, Q = 14,6 kVAr
B) P = 25,1 kW, Q = 9,1 kVAr
C) P = 14,6 kW, Q = 7,2 kVAr
D) P =18,8 kW, Q = -14,6 kVAr
E) P = 25,1 kW, Q = -9,1 kVAr

2. *3 boda*

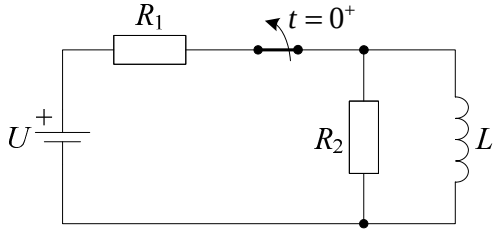
Trofazno trošilo s impedancijama $\underline{Z}_1 = j10\ \Omega$, $\underline{Z}_2 = \frac{10}{\sqrt{3}}\left(1 + j\sqrt{3}\right)\ \Omega$ i $\underline{Z}_3 = j10\ \Omega$ spojeno je u zvijezdu i priključeno četverovodno na simetrični trofazni izvor linijskog napona $U_l = 400$ V. Odrediti iznos struje kroz nulvodič.

A) $I_0 = 20$ A
B) $I_0 = 5\sqrt{2}$ A
C) $I_0 = 0$ A
D) $I_0 = \frac{20\sqrt{3}}{3}$ A
E) $I_0 = 10\sqrt{2}$ A

3. *2 boda*

U krugu prema slici u trenutku $t = 0^+$ otvara se sklopka. Odrediti ukupnu toplinsku energiju koja će se razviti na otporniku R_2. Zadano je: $R_1 = 5\ \Omega$, $R_2 = 5\ \Omega$, $L = 5$ mH, $U = 10$ V.

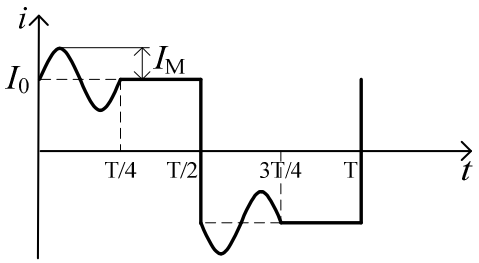
A) W = 10 mJ
B) W = 15 mJ
C) W = 23 mJ
D) W = 29 mJ
E) W = 37 mJ



4. *2 boda*

Odredite efektivnu vrijednost struje valnog oblika prema slici. Zadano je: $I_0 = 3$ A, $I_M = 2$ A.

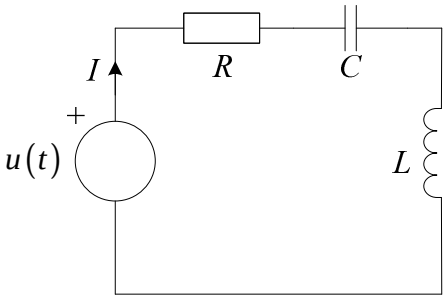
A) I_{ef} = 3,2 A
B) I_{ef} = 4,1 A
C) I_{ef} = 3,8 A
D) I_{ef} = 5,0 A
E) I_{ef} = 4,5 A



5. *2 boda*

U spoju prema slici napon izvora je $u(t) = U_0 + U_{m1}\sin(\omega t - \pi/6) - U_{m2}\sin(3\omega t - \pi/4)$ V. Odrediti efektivnu vrijednost struje izvora ako je zadano:
$U_0 = 10$ V, $U_{m1} = 20\sqrt{2}$ V, $U_{m2} = 12\sqrt{2}$ V, $R = 6\ \Omega$, $X_L(\omega) = 1\ \Omega$, $X_C(\omega) = 9\ \Omega$.

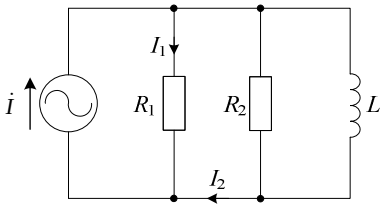
A) I_{ef} = 4,2 A
B) I_{ef} = 3,7 A
C) I_{ef} = 3,2 A
D) I_{ef} = 2,8 A
E) I_{ef} = 2,0 A



6. Izračunaj radnu snagu u spoju prema slici. Zadano je: $I = 5$ A, $I_1 = 3$ A, $I_2 = 3$ A, $R_2 = 4\ \Omega$.

***3** boda*

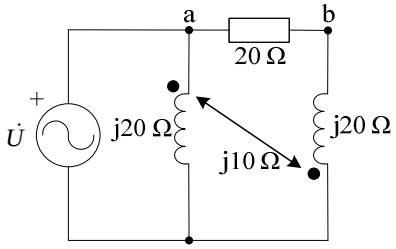
A) P = 61,7 W
B) P = 28,3 W
C) P = 54,1 W
D) P = 41,2 W
E) P = 19,4 W



7. Izračunaj iznos napona U_{ab} na otporniku u spoju prema slici. Zadano je $\dot{U} = 40\angle 0°$ V.

***3** boda*

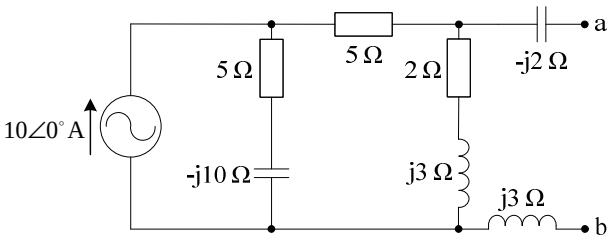
A) U_{ab} = 33,3 V
B) U_{ab} = 27,5 V
C) U_{ab} = 40,0 V
D) U_{ab} = 21,2 V
E) U_{ab} = 48,0 V



8. Odredite parametre Theveninovog nadomjesnog izvora s priključnica *a* i *b*.

***3** boda*

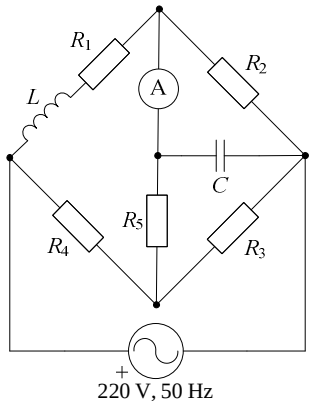
A) $\dot{U}_T = 29,0\angle 23°$ V, $\underline{Z}_T = 2,4 + j2,6\ \Omega$
B) $\dot{U}_T = 11,3\angle 5°$ V, $\underline{Z}_T = 2,4 + j2,6\ \Omega$
C) $\dot{U}_T = 22,8\angle 24°$ V, $\underline{Z}_T = 3,8 + j3,0\ \Omega$
D) $\dot{U}_T = 11,3\angle 5°$ V, $\underline{Z}_T = 2,7 + j3,4\ \Omega$
E) $\dot{U}_T = 29,0\angle 23°$ V, $\underline{Z}_T = 2,7 + j3,4\ \Omega$



9. U spoju prema slici struja kroz ampermetar iznosi $I_A = 0$. Zadano je:
$R_2 = 1$ kΩ, $R_3 = R_4 = 2$ kΩ, $R_5 = 200\ \Omega$, $C = 1$ μF. Odredite R_1.

***3** boda*

A) R_1 = 5 kΩ
B) R_1 = 4 kΩ
C) R_1 = 1 kΩ
D) R_1 = 3 kΩ
E) R_1 = 2 kΩ



10. Odredite $\dot{U}_{ab}$ u spoju prema slici. Zadano je:
$R = 2\ \Omega$, $X_C = X_L = 2\ \Omega$, $\dot{U}_1 = 10\angle 30°$ V, $\dot{U}_2 = 10\angle 150°$ V, $\dot{U}_3 = 10\angle -90°$ V.

***3** boda*

A) $\dot{U}_{ab} = 8,2\angle -44°$ V
B) $\dot{U}_{ab} = 4,3\angle -72°$ V
C) $\dot{U}_{ab} = 7,1\angle -103°$ V
D) $\dot{U}_{ab} = 5,1\angle -118°$ V
E) $\dot{U}_{ab} = 6,5\angle -91°$ V