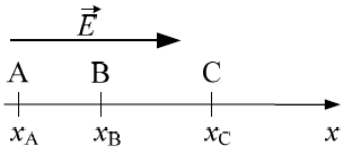
1. U homogenom elektrostatskom polju jakosti E = 10 MV/m, koje djeluje u smjeru x-osi, na osi x odabrane su tri točke (A, B i C) s koordinatama x_A = 0 cm, x_B = 2 cm i x_C = 5 cm. Koliki se ukupni rad obavi prilikom premještanja pokusnog naboja Q_0 = –100 pAs iz točke B u točku C, a potom iz točke C u točku A. *Napomena: rad što ga obavi elektrostatsko polje je pozitivan.*

3 boda

A) +50 μJ
B) +30 μJ
C) +20 μJ
D) –20 μJ
E) –30 μJ



2. U zračnom pločastom kondenzatoru s pločama površine 20 cm^2, razmaknutim 0,5 mm, nakupljeno je 10 μJ energije. Kolika je jakost elektrostatskog polja *E* u kondenzatoru?

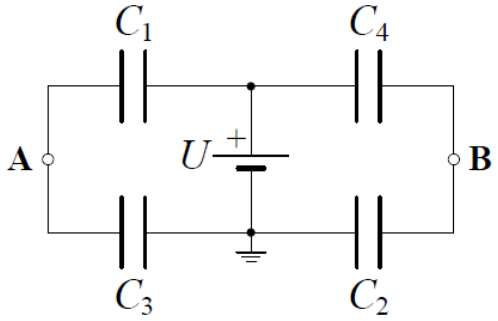
3 boda

A) 1 kV/cm B) 5 kV/cm C) 10 kV/cm D) 15 kV/cm E) 20 kV/cm

1. Odredite iznos napona U_{AB} ako je $U = 24\text{V}$. Zadano: $C_1 = C_3 = 30\ \mu\text{F}$, $C_2 = 40\ \mu\text{F}$, $C_4 = 80\ \mu\text{F}$.

3 *boda*

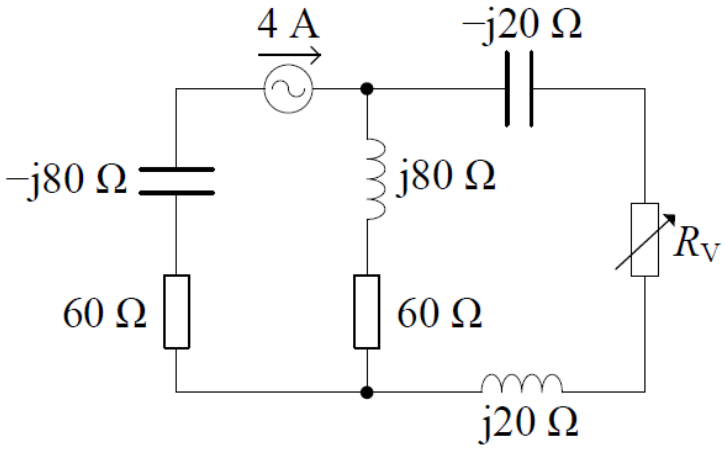
A) $U_{AB} = 4$ V
B) $U_{AB} = -4$ V
C) $U_{AB} = 20$ V
D) $U_{AB} = -20$ V
E) $U_{AB} = 0$ V



13. Odredite maksimalnu snagu koja može disipirati na promjenjivom otporu R_V.

3 boda

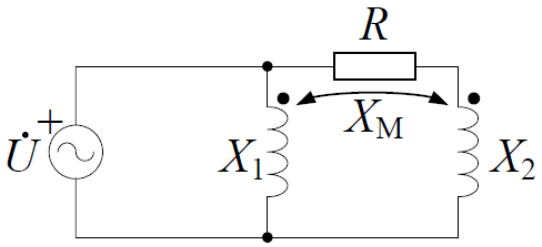
A) 0 W
B) 31,25 W
C) 500 W
D) 960 W
E) 1600 W



14. Odredite snagu na otporniku R = 25 Ω u spoju prema slici ako je $X_1 = X_2$ = 25 Ω, X_M = 20 Ω i U = 25 V.

3 boda

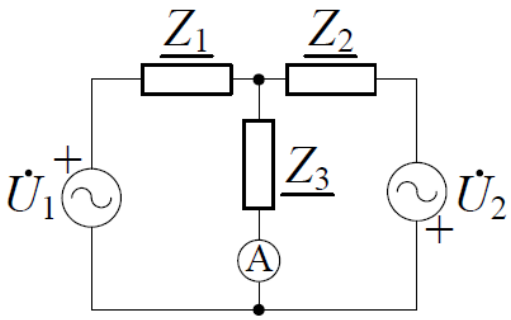
A) 71,71W
B) 7,04 W
C) 1 W
D) 0,89 W
E) 0,21 W



15. Odredite pokazivanje ampermetra u mreži prema slici, ako je zadano: $\underline{Z}_1 = 1 + \mathrm{j}2\,\Omega$, $\underline{Z}_2 = 1 - \mathrm{j}2\,\Omega$, $\underline{Z}_3 = 1 + \mathrm{j}2\,\Omega$, $\dot{U}_1 = 10\,\mathrm{V}$, $\dot{U}_2 = 5 - \mathrm{j}8{,}66\,\mathrm{V}$.

3 boda

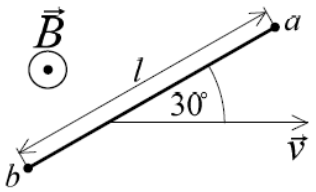
A) 0 A
B) 3,05 A
C) 5,33 A
D) 6,83 A
E) 10,35 A



3. Vodljivi štap duljine l = 1 m giba se u homogenom magnetskom polju indukcije B = 0,5 T konstantnom brzinom v = 6 m/s prema slici. Odredite inducirani napon U_{ab}.

2 *boda*

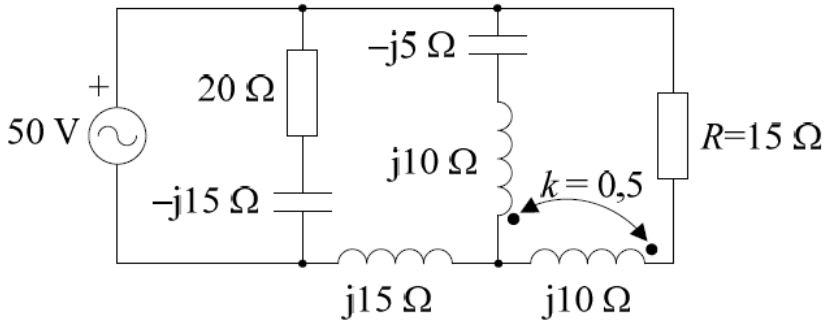
A) U_{ab} = –4,5 V
B) U_{ab} = –1,5 V
C) U_{ab} = 0 V
D) U_{ab} = +1 V
E) U_{ab} = +3 V



12. Izračunajte snagu na otporniku ***R*** u spoju prema slici.

3 *boda*

A) 15 W
B) 20 W
C) 25 W
D) 60 W
E) 100 W



3. Odredite iznos $\left|\vec{B}_1\right| / \left|\vec{B}_2\right|$ ako je $I = 3{,}73$ A, $\mu = \mu_0$ i $a = 25$ cm.

2 boda

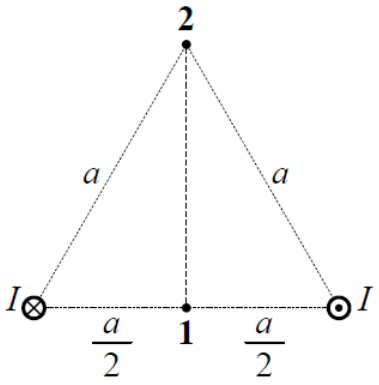
A) $\left|\vec{B}_1\right| / \left|\vec{B}_2\right| = 1$

B) $\left|\vec{B}_1\right| / \left|\vec{B}_2\right| = 1/4$

C) $\left|\vec{B}_1\right| / \left|\vec{B}_2\right| = 4$

D) $\left|\vec{B}_1\right| / \left|\vec{B}_2\right| = 1/8$

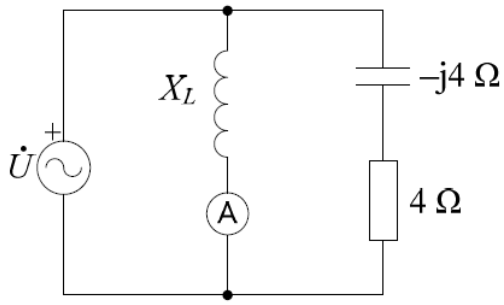
E) $\left|\vec{B}_1\right| / \left|\vec{B}_2\right| = 8$



14. U spoju prema slici **ampermetar pokazuje 1 A**. Odredite radnu snagu izvora ako je krug u rezonanciji.

3 boda

A) 1 W
B) 2,83 W
C) 4 W
D) 5,66 W
E) 8 W



2. Trošilo radne snage $P = 500$ W ima faktor snage $\cos \varphi = 0{,}707$. Za popravljanje faktora snage na $\cos \varphi = 1$ spajamo kondenzator paralelno trošilu. Koliki treba biti kapacitet kondenzatora ako je napon izvora $U = 220$ V, a frekvencija $f = 50$ Hz.

2 *boda*

A) 12 μF B) 18 μF C) 24 μF D) 33 μF E) 66 μF

7. Odredite rezonantnu kružnu frekvenciju za spoj prema slici:

3 *boda*

A) $\omega_0 = 1000\ s^{-1}$
B) $\omega_0 = 3000\ s^{-1}$
C) $\omega_0 = 5000\ s^{-1}$
D) $\omega_0 = 9000\ s^{-1}$
E) $\omega_0 = 12000\ s^{-1}$