PHYS 102: General Physics 2 **KOÇ UNIVERSITY** **Spring Semester 2013**

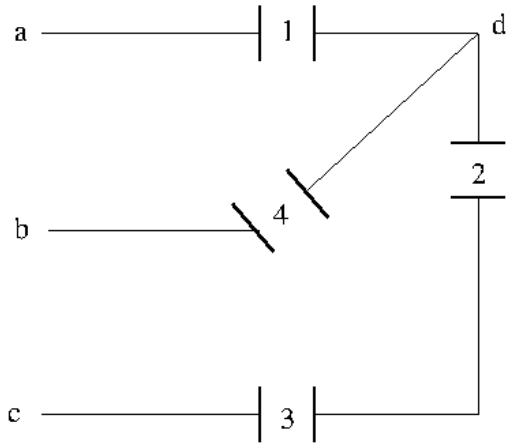
College of Sciences

Section 1 **Quiz 4** **7 March 2013**

Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:** **Signature:**

Consider a piece of circuit where the ideal capacitors C_1, C_2, C_3 and C_4 are connected as shown in the figure. If the voltage differences are measured to be $V_{ab} = V_0, V_{bc} = V_1$, and $V_{cd} = V_2$, find the charge on the first capacitor in terms of the given variables.



QUIZ-4 PHYS-102, Spring 2013

Section 1

ideal capacitors C_1, C_2, C_3, C_4

charge on the 1st capacitor in terms of given variables

$V_{ab} = V_0$

$V_{bc} = V_1$

$V_{cd} = V_2$

$Q_1 = C_1 V_{1^{st}\,capacitor} = C_1 V_{ad}$

$V_{ad} = V_{ab} - V_{db}$

$= V_{ab} + (V_{bc} - V_{dc})$

$= V_{ab} + V_{bc} + V_{cd}$

$= V_0 + V_1 + V_2$

$Q_1 = C(V_0 + V_1 + V_2)$

PHYS 102: General Physics 2 **KOÇ UNIVERSITY** **Spring Semester 2013**

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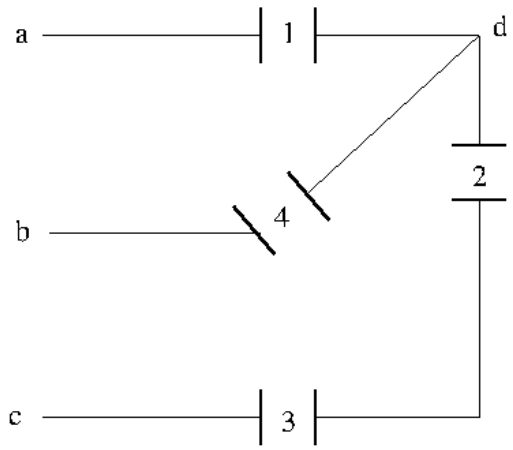
Section 2 **Quiz 4** **7 March 2013**

Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:** **Signature:**

Consider a piece of circuit where the ideal capacitors C_1, C_2, C_3 and C_4 are connected as shown in the figure. If the voltage differences are measured to be $V_{ab} = V_0, V_{bc} = V_1$, and $V_{cd} = V_2$, find the energy stored in the fourth capacitor in terms of the given variables.



Section 2 energy stored in the 4th capacitor in terms of given variables

$V_{ab} = V_0$

$V_{bc} = V_1$

$V_{cd} = V_2$

$U = \frac{1}{2} CV^2 = \frac{1}{2} C_4 V_{bd}^2$

$U = \frac{1}{2} C (V_1 + V_2)^2$

$V_{bd} = V_{bc} - V_{dc}$

$= V_{bc} + V_{cd}$

$= V_1 + V_2$

PHYS 102: General Physics 2 **KOÇ UNIVERSITY** **Spring Semester 2013**

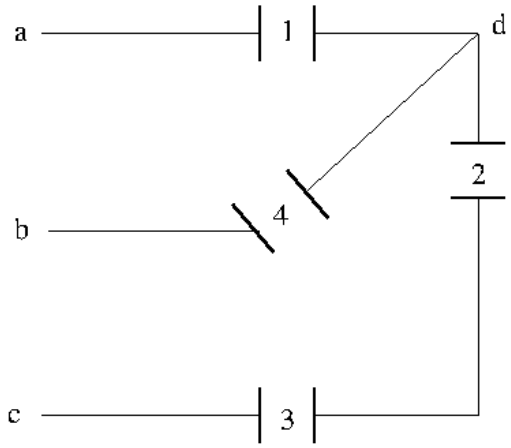
College of Sciences

Section 3 **Quiz 4** **7 March 2013**

Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: **Student ID:** **Signature:**

Consider a piece of circuit where the ideal capacitors C_1, C_2, C_3 and C_4 are connected as shown in the figure. If the voltage differences are measured to be $V_{ab} = V_0$ and $V_{bc} = V_1$, and the energy stored in the fourth capacitor is measured to be U, find the charge on the first capacitor in terms of the given variables.



Section 3

charge on the first capacitor in terms of given variables

$V_{ab} = V_0$

$V_{bc} = V_1$

energy stored in 4th capacitor = U

$Q_1 = C_1 V_{ad}$

$V_{ad} = V_0 + V_{bd}$

$U = \frac{1}{2} C V_{bd}^2$

$V_{bd} = \sqrt{\frac{2U}{C}}$

$Q_1 = C\left(V_0 + \sqrt{\frac{2U}{C}}\right)$

Phys 102 KOÇ UNIVERSITY Spring Semester 2013

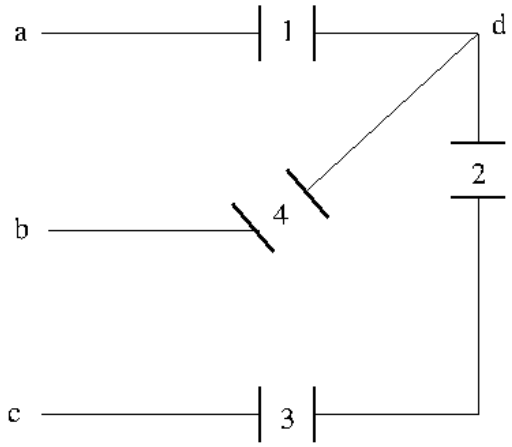
College of Sciences

Section 6 Quiz 4 7 March 2013

Closed book. No calculators are to be used for this quiz.
Quiz duration: 10 minutes

Name: Student ID: Signature:

Consider a piece of circuit where the ideal capacitors C_1, C_2, C_3 and C_4 are connected as shown in the figure. If the voltage differences are measured to be $V_{ab} = V_0, V_{bc} = V_1$, and $V_{cd} = V_2$, find the energy stored on the second capacitor in terms of the given variables.

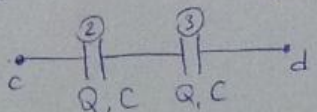


Section 6 energy stored on 2nd capacitor

$V_{ab} = V_0$

$V_{bc} = V_1$

$V_{cd} = V_2$



$U_2 = \frac{1}{2} C V_{2nd\ capacitor}^2$

$= \frac{1}{2} C \left(\frac{V_2}{2}\right)^2$