PHYSICS II

Assoc.Prof. Yeşim MOĞULKOÇ

Problems

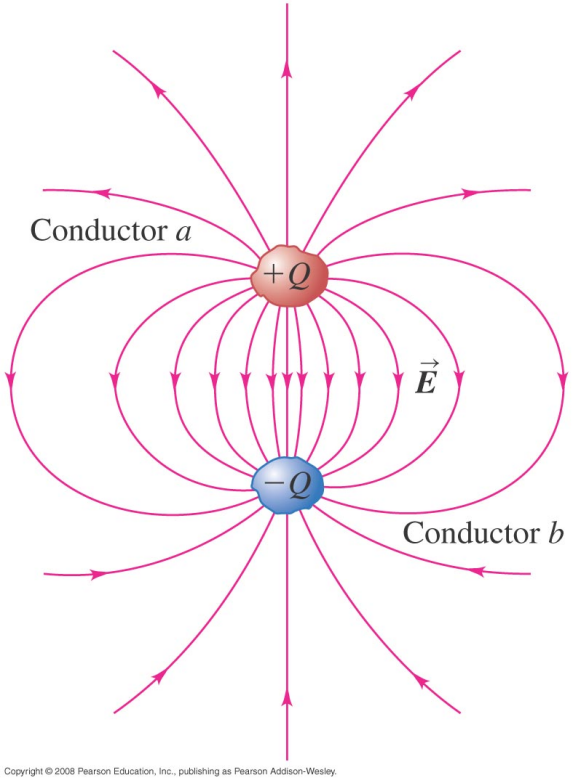
- *Problems are used from;*

University Physics, Twelfth Edition

Hugh D. Young and Roger A. Freedman

Q24.1

The two conductors *a* and *b* are insulated from each other, forming a capacitor. You increase the charge on *a* to $+2Q$ and increase the charge on *b* to $-2Q$, while keeping the conductors in the same positions.



As a result of this change, the capacitance *C* of the two conductors

A. becomes 4 times great.

B. becomes twice as great.

C. remains the same.

D. becomes 1/2 as great.

E. becomes 1/4 as great.

A24.1

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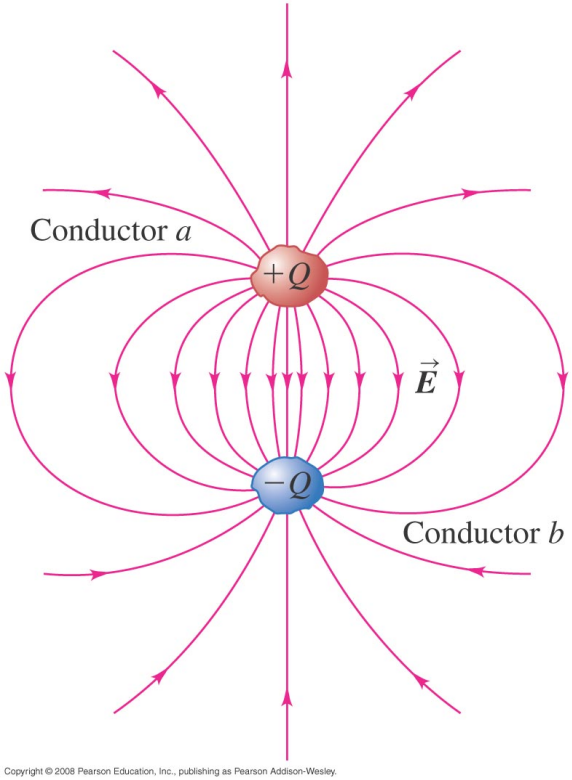

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A. becomes 4 times great.

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✓ C. remains the same.

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Q24.2

You reposition the two plates of a capacitor so that the capacitance doubles. There is vacuum between the plates.

If the charges $+Q$ and $-Q$ on the two plates are kept constant in this process, what happens to the potential difference V_{ab} between the two plates?

A. V_{ab} becomes 4 times as great

B. V_{ab} becomes twice as great

C. V_{ab} remains the same

D. V_{ab} becomes 1/2 as great

E. V_{ab} becomes 1/4 as great

A24.2

You reposition the two plates of a capacitor so that the capacitance doubles. There is vacuum between the plates.

If the charges $+Q$ and $-Q$ on the two plates are kept constant in this process, what happens to the potential difference V_{ab} between the two plates?

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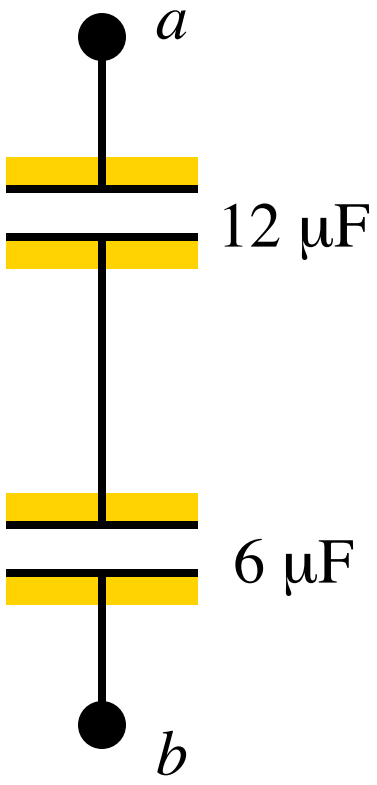
Q24.3

A 12–μF capacitor and a 6–μF capacitor are connected together as shown. What is the equivalent capacitance of the two capacitors as a unit?



A. $C_{eq} = 18\ \mu F$

B. $C_{eq} = 9\ \mu F$

C. $C_{eq} = 6\ \mu F$

D. $C_{eq} = 4\ \mu F$

E. $C_{eq} = 2\ \mu F$

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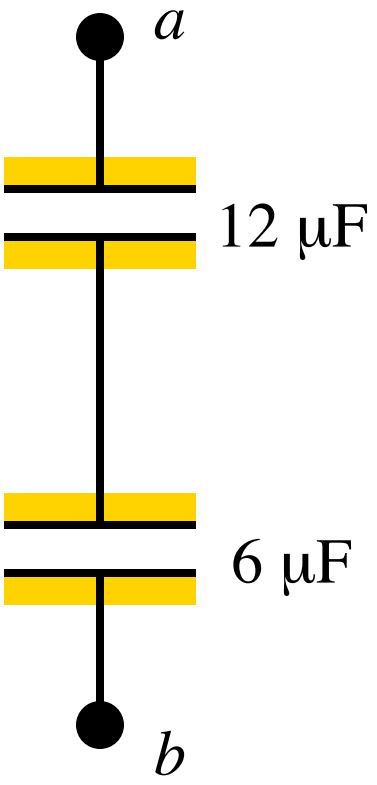
A 12–μF capacitor and a 6–μF capacitor are connected together as shown. What is the equivalent capacitance of the two capacitors as a unit?



A. $C_{eq} = 18\ \mu F$

B. $C_{eq} = 9\ \mu F$

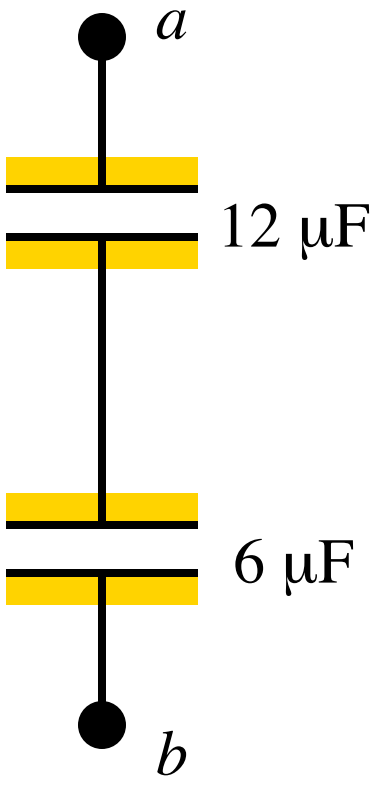
C. $C_{eq} = 6\ \mu F$

✓ D. $C_{eq} = 4\ \mu F$

E. $C_{eq} = 2\ \mu F$

Q24.4

A 12–μF capacitor and a 6–μF capacitor are connected together as shown. If the charge on the 12–μF capacitor is 24 microcoulombs (24 μC), what is the charge on the 6–μF capacitor?



A. 48 μC

B. 36 μC

C. 24 μC

D. 12 μC

E. 6 μC

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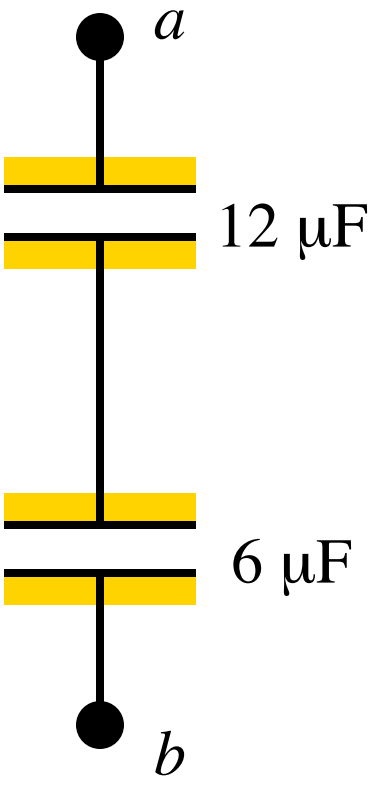


A. 48 μC

B. 36 μC

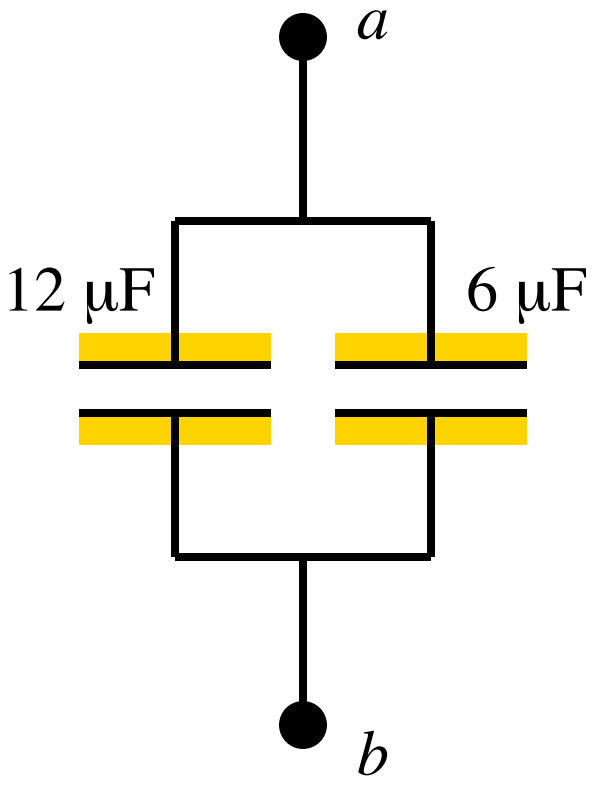
C. 24 μC

D. 12 μC

E. 6 μC

Q24.5

A 12–μF capacitor and a 6–μF capacitor are connected together as shown. What is the equivalent capacitance of the two capacitors as a unit?



A. $C_{eq} = 18\ \mu F$

B. $C_{eq} = 9\ \mu F$

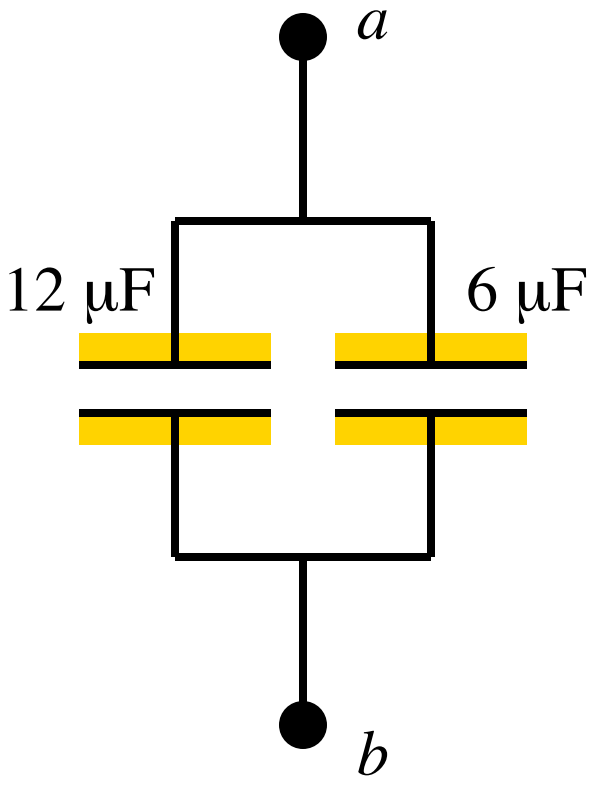
C. $C_{eq} = 6\ \mu F$

D. $C_{eq} = 4\ \mu F$

E. $C_{eq} = 2\ \mu F$

A24.5

A 12–μF capacitor and a 6–μF capacitor are connected together as shown. What is the equivalent capacitance of the two capacitors as a unit?



A. $C_{eq} = 18\ \mu F$

B. $C_{eq} = 9\ \mu F$

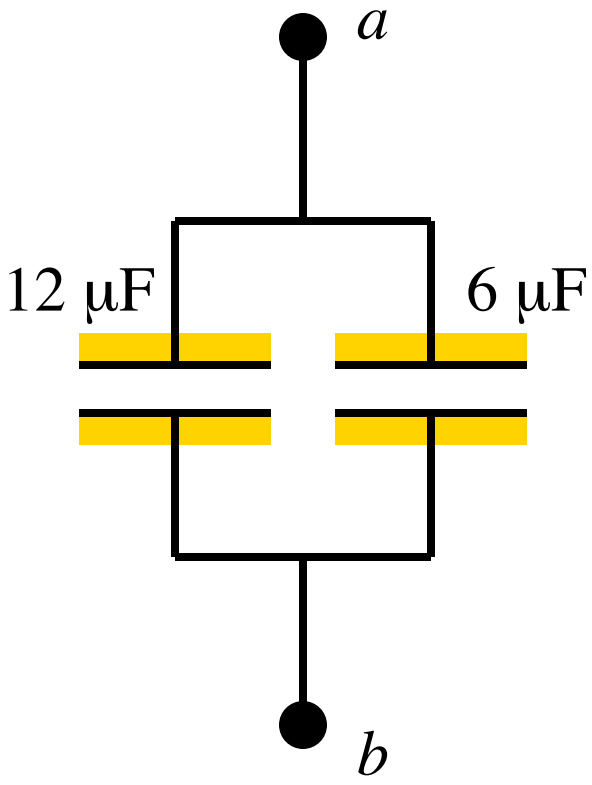
C. $C_{eq} = 6\ \mu F$

D. $C_{eq} = 4\ \mu F$

E. $C_{eq} = 2\ \mu F$

Q24.6

A 12–μF capacitor and a 6–μF capacitor are connected together as shown. If the charge on the 12–μF capacitor is 24 microcoulombs (24 μC), what is the charge on the 6–μF capacitor?



A. 48 μC

B. 36 μC

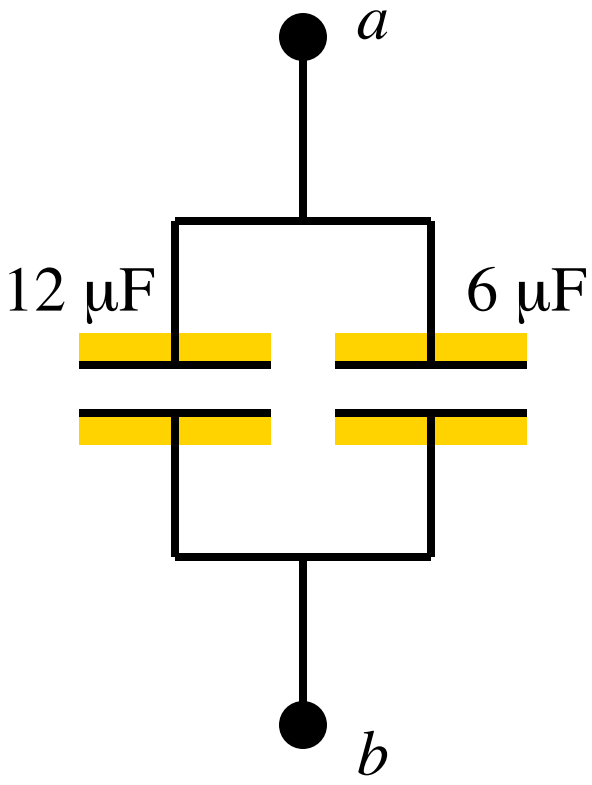
C. 24 μC

D. 12 μC

E. 6 μC

A24.6

A 12–μF capacitor and a 6–μF capacitor are connected together as shown. If the charge on the 12–μF capacitor is 24 microcoulombs (24 μC), what is the charge on the 6–μF capacitor?



A. 48 μC

B. 36 μC

C. 24 μC

✓ D. 12 μC

E. 6 μC

Q24.7

You reposition the two plates of a capacitor so that the capacitance doubles. There is vacuum between the plates.

If the charges $+Q$ and $-Q$ on the two plates are kept constant in this process, the energy stored in the capacitor

A. becomes 4 times greater.

B. becomes twice as great.

C. remains the same.

D. becomes 1/2 as great.

E. becomes 1/4 as great.

A24.7

You reposition the two plates of a capacitor so that the capacitance doubles. There is vacuum between the plates.

If the charges $+Q$ and $-Q$ on the two plates are kept constant in this process, the energy stored in the capacitor

A. becomes 4 times greater.

B. becomes twice as great.

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D. becomes 1/2 as great.

E. becomes 1/4 as great.

Q24.8

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *charges* on the plates remain constant.

What effect does adding the dielectric have on the *potential difference* between the capacitor plates?

A. The potential difference increases.

B. The potential difference remains the same.

C. The potential difference decreases.

D. not enough information given to decide

A24.8

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *charges* on the plates remain constant.

What effect does adding the dielectric have on the *potential difference* between the capacitor plates?

A. The potential difference increases.

B. The potential difference remains the same.

C. The potential difference decreases.

D. not enough information given to decide

Q24.9

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *charges* on the plates remain constant.

What effect does adding the dielectric have on the *energy stored* in the capacitor?

A. The stored energy increases.

B. The stored energy remains the same.

C. The stored energy decreases.

D. not enough information given to decide

A24.9

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *charges* on the plates remain constant.

What effect does adding the dielectric have on the *energy stored* in the capacitor?

A. The stored energy increases.

B. The stored energy remains the same.

C. The stored energy decreases.

D. not enough information given to decide

Q24.10

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *potential difference* between the plates remains constant.

What effect does adding the dielectric have on the *amount of charge* on each of the capacitor plates?

A. The amount of charge increases.

B. The amount of charge remains the same.

C. The amount of charge decreases.

D. not enough information given to decide

A24.10

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *potential difference* between the plates remains constant.

What effect does adding the dielectric have on the *amount of charge* on each of the capacitor plates?

A. The amount of charge increases.

B. The amount of charge remains the same.

C. The amount of charge decreases.

D. not enough information given to decide

Q24.11

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *potential difference* between the plates remains constant.

What effect does adding the dielectric have on the *energy stored* in the capacitor?

A. The stored energy increases.

B. The stored energy remains the same.

C. The stored energy decreases.

D. not enough information given to decide

A24.11

You slide a slab of dielectric between the plates of a parallel-plate capacitor. As you do this, the *potential difference* between the plates remains constant.

What effect does adding the dielectric have on the *energy stored* in the capacitor?

A. The stored energy increases.

B. The stored energy remains the same.

C. The stored energy decreases.

D. not enough information given to decide