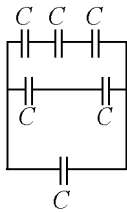1. A parallel-plate capacitor has capacitance C. A second parallel-plate capacitor has plates with twice the area and half the separation. The capacitance of this second capacitor is most nearly

A) $\frac{1}{4}C$

B) $\frac{1}{2}C$

C) C

D) $2C$

E) $4C$

2. When a voltage V is applied to a parallel-plate capacitor, it is able to hold a charge Q. A second parallel plate capacitor has plates with half the area and twice the separation. What a voltage V must applied to it, in order to hold the same charge Q?

A) $\frac{1}{4}V$

B) $\frac{1}{2}V$

C) V

D) $2V$

E) $4V$

3. When a voltage V is applied to a parallel-plate capacitor, it is able to hold a charge Q. A second parallel plate capacitor has plates with half the area and twice the separation. When a voltage V is applied to it, the amount of charge that it can hold is

A) $\frac{1}{4}Q$

B) $\frac{1}{2}Q$

C) Q

D) $2Q$

E) $4Q$

4. The product of 2 ohms $\times$ 2 farads is equal to

A) 4 volts

B) 4 amperes

C) 4 joules

D) 4 seconds

E) 4 watts

5. A parallel plate capacitor with plates of area A separated by a distance d is charged so that the potential difference across the plates is V. If the distance between the plates is decreased to $\frac{1}{2}d$, the potential across the plates is now

A) $\frac{1}{4}V$

B) $\frac{1}{2}V$

C) V

D) $2V$

E) $4V$

6. The capacitance of a parallel plate capacitor can be increased by decreasing which of the following?

A) The area of each plate

B) The distance between the plates

C) The charge on each plate

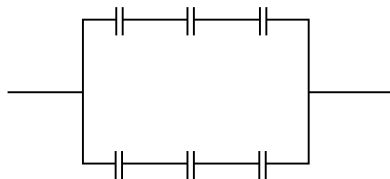D) The potential difference across the plates

E) None of the above

7.

If the capacitance of one capacitor is C, find the capacitance of the above diagram.

A) $\frac{C}{6}$

B) $\frac{5C}{2}$

C) $\frac{6C}{11}$

D) $\frac{11C}{6}$

E) $6C$

8.

If the capacitance of each capacitor above is 5 pF, find the capacitance of the entire combination.

A) $\frac{1}{6}$ pF

B) $\frac{2}{3}$ pF

C) $\frac{5}{6}$ pF

D) $\frac{3}{2}$ pF

E) $\frac{10}{3}$ pF

9. Which of the following would increase the capacitance of a parallel-plate capacitor?

A) Increasing the area of the plates

B) Increasing the voltage between the plates

C) Decreasing the voltage between the plates

D) Moving the plates closer together

E) Moving the plates further apart

Base your answers to questions **10** and **11** on the following scenario. Two capacitors are made from parallel plates with surface area A, a distance d apart. Capacitor A has a voltage V across it. Capacitor B has a voltage $2V$ across it.

10. The ratio of the capacitance of B to the capacitance of A is

A) 1:4

B) 1:2

C) 1:1

D) 2:1

E) 4:1

11. The ratio of the charge that can be stored in A to the charge that can be stored in B is

A) 1:4

B) 1:2

C) 1:1

D) 2:1

E) 4:1

12. The plates of a 4 μF capacitor are charged to a potential difference of 40 kV. The charge on the positive plate is

A) 0.16 C

B) 1.6 C

C) 0.08 C

D) 0.1 C

E) 0.01 C

13. The plates of a capacitor store 0.01 C of charge. If the potential across the capacitor is 10 MV, the capacitance of the capacitor is

A) 0.1 nF

B) 1 nF

C) 10 nF

D) 100 nF

E) 1000 nF

Base your answers to questions **14** through **17** on the following chart which gives the dimensions of several parallel plate capacitors.

Capacitor	Plate Length	Plate Width	Separation Between Plates
A	l	w	d
B	$2l$	w	d
C	$2l$	$2w$	d
D	$2l$	$2w$	$2d$
E	l	w	$2d$

14. Which capacitor has the greatest capacitance?

A) A

B) B

C) C

D) D

E) E

15. Which capacitor has the least capacitance?

A) A

B) B

C) C

D) D

E) E

16. Which 2 capacitors have the same capacitance?

A) B and E

B) B and C

C) B and D

D) C and D

E) C and E

17. When capacitor A is attached to a battery with potential V it can store a charge Q. How much charge can capacitor D hold when attached to an identical battery?

A) $\frac{1}{4}Q$

B) $\frac{1}{2}Q$

C) $2Q$

D) $4Q$

E) $8Q$

18. Two parallel conducting plates, separated by a distance d, are connected to a battery with a voltage source that supplies a potential difference V. If the separation between the plates is halved, which of the following will occur?

A) The electric charge on the plates will be halved.

B) The electric charge on the plates will be doubled.

C) The potential difference between the plates will be halved.

D) The potential difference between the plates will be doubled.

E) The capacitance will not change.

1. E

2. E

3. A

4. D

5. B

6. B

7. D

8. E

9. D

10. C

11. B

12. A

13. B

14. C

15. E

16. C

17. C

18. B

Name _____   Class _____   Date _____

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____