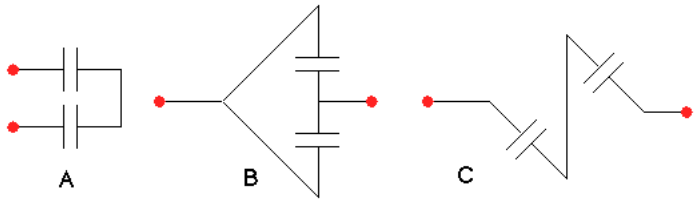
Which of the following groups of capacitors are joined in parallel? (The red dots indicate where they to be joined into a larger circuit.) Explain your reasoning.



Step 1: avoid the graphic appearance and trace wires

A parallel capacitor has the terminals connected to a terminal of another capacitor. B appears to be a series capacitor rather than a parallel capacitor. I believe it would be A and C which are joined in parallel.

A and C are parallel simply because they're in line with each other. That's what parallel capacitors are.

Key: Find the ones where pairs of plates on either side are connected together

A) is not in parallel because the plates on the left are not connected so their drop in potential is not necessarily the same

B) IS in parallel because the top most and bottom most plate are connected as are the middle two plates so their respective potential drops are the same.

C) is not in parallel for the same reason as A), the left most plate and right most plate are not connected another plate so their potential drop is not necessarily the same

Note: capacitors do not allow current flow

A and C are both in a series. B would be the only parallel. This is because the circuit takes one path through the gates at A and C while B has two separate and equal paths that each have a gate on them.

You have 3 identical capacitors, each having a capacitance of 6 F (farads). What different equivalent capacitances can be constructed by combining them together in various clever ways? Explain the combinations you need and how you get those values. (You must use all three capacitors for each combination.)

There are two obvious ways to connect them

Parallel: total capacitance is the SUM of all capacities. Therefore, 6F + 6F + 6F = 18 F.

Series: reciprocal of the total capacitance is equal to the sum of the reciprocal values of the individual capacities. Therefore, 1/Ctotal = 1/6F + 1/6F +1/6F = 1/2F ---> Ctotal = 2F

Okay, though units are scandalously dropped!

You can have 3 capacitors in parallel or 3 capacitors in a combination series. In parallel, you have 18F because you add them up like 6+6+6=18F. For the combination series, you can have a combination series that gives 6F by (1/6)+(1/6)+(1/6)=3/6=1/2 which is 1/Cseries. Then we take the reciprocal which gives 2F.

When a particular capacitor is connected in a circuit, the potential difference between the two plates is measured to be 12 Volts. Later, after the circuit is altered, the potential drop is measured again and found to be 24 Volts. By what factor has the capacitance changed from the previous situation?

a. It is doubled
b. It is halved
c. It changes by some other factor
d. It is unchanged