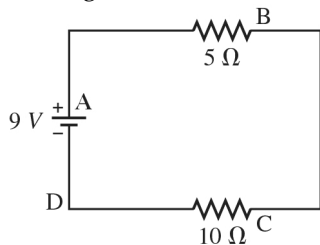


- 1) When two or more different capacitors are connected in series across a potential source, which of the following statements must be true? (There could be more than one correct choice.)
 - A) The potential difference across each capacitor is the same.
 - B) The equivalent capacitance of the combination is less than the capacitance of any of the capacitors.
 - C) The capacitor with the largest capacitance has the most charge.
 - D) Each capacitor carries the same amount of charge.
 - E) The total voltage across the combination is the algebraic sum of the voltages across the individual capacitors.
- 2) Three identical capacitors are connected in series across a potential source (battery). If a charge of Q flows into this combination of capacitors, how much charge does each capacitor carry?
 - A) $Q/3$
 - B) $Q/9$
 - C) $3Q$
 - D) Q
- 3) Three identical capacitors are connected in parallel to a potential source (battery). If a charge of Q flows into this combination, how much charge does each capacitor carry?
 - A) Q
 - B) $Q/9$
 - C) $Q/3$
 - D) $3Q$
- 4) When two or more different capacitors are connected in parallel across a potential source (battery), which of the following statements must be true? (There could be more than one correct choice.)
 - A) The potential difference across each capacitor is the same.
 - B) The capacitor with the largest capacitance has the most charge.
 - C) The equivalent capacitance of the combination is less than the capacitance of any one of the capacitors.
 - D) Each capacitor carries the same amount of charge.
 - E) The capacitor with the largest capacitance has the largest potential difference across it.
- 5) Four unequal resistors are connected in a parallel with each other. Which one of the following statements is correct about this combination?
 - A) The equivalent resistance is equal to the average of the four resistances.
 - B) The equivalent resistance is midway between the largest and smallest resistance.
 - C) The equivalent resistance is less than that of the smallest resistor.
 - D) The equivalent resistance is more than the largest resistance.
 - E) None of the other choices is correct.
- 6) When unequal resistors are connected in parallel in a circuit,
 - A) the potential drop is always the same across each resistor.
 - B) the power generated in each resistor is the same.
 - C) the largest resistance has the largest current through it.
 - D) the same current always runs through each resistor.
- 7) When unequal resistors are connected in series across an ideal battery,
 - A) the equivalent resistance of the circuit is less than that of the smallest resistor.
 - B) the equivalent resistance of the circuit is equal to the average of all the resistances.
 - C) the same power is dissipated in each one.
 - D) the potential difference across each is the same.
 - E) the current flowing in each is the same.

- 8) As more resistors are added in series to a constant voltage source, the power supplied by the source
- increases.
 - decreases.
 - increases for a time and then starts to decrease.
 - does not change.

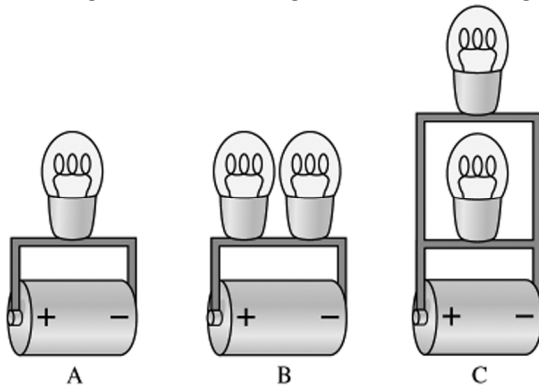
- 9) As more resistors are added in parallel across a constant voltage source, the power supplied by the source
- goes up then down
 - decreases.
 - no change.
 - increases.

- 10) A 9-V battery is hooked up to two resistors in series. One has a resistance of $5\ \Omega$, and the other has a resistance of $10\ \Omega$. Several locations along the circuit are marked with letters, as shown in the figure. Through which resistor is energy being dissipated at the higher rate?



- Energy is at the same rate.
- the $10\text{-}\Omega$ resistor
- the $5\text{-}\Omega$ resistor

- 11) Identical light bulbs can be attached to identical ideal batteries in three different ways (A, B, or C), as shown in the figure. The ranking (from lowest to highest) of the *total* power produced by the battery is



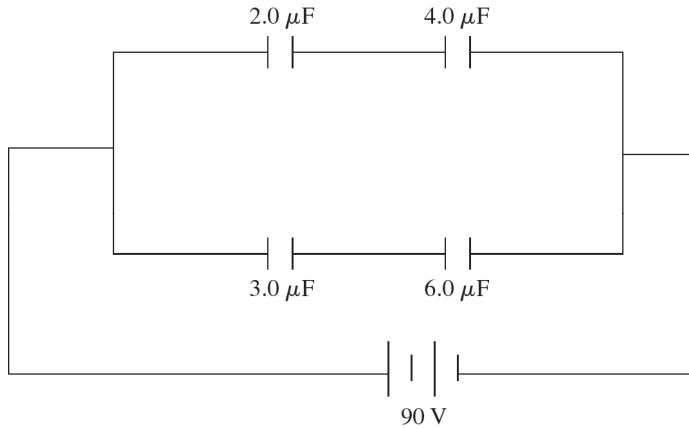
- A, C, B
- C, A, B
- B, A, C
- C, B, A
- A, B, C

- 12) An ideal ammeter should
- consist of a galvanometer in series with a large resistor.
 - introduce a very small series resistance into the circuit whose current is to be measured.
 - introduce a very large series resistance into the circuit whose current is to be measured.
 - have a high coil resistance.

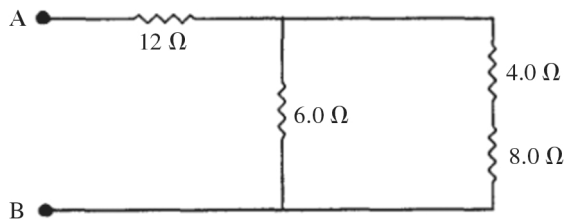
- 13) You have three capacitors with capacitances of $4.00\ \mu\text{F}$, $7.00\ \mu\text{F}$, and $9.00\ \mu\text{F}$. What is the equivalent capacitance if they are connected (a) in series and (b) in parallel?

- 14) A $5.0\text{-}\mu\text{F}$ capacitor and a $7.0\text{-}\mu\text{F}$ capacitor are connected in series across an 8.0-V potential source. What is the potential difference across the $5.0\text{-}\mu\text{F}$ capacitor?

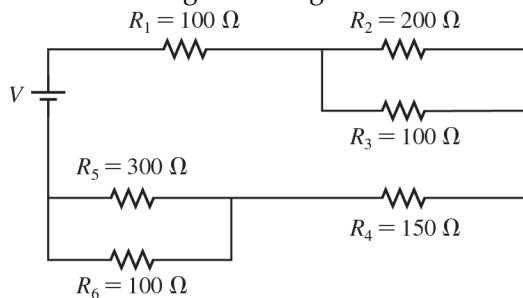
- 15) A system of four capacitors is connected across a 90-V voltage source as shown in the figure. What is the equivalent capacitance of this system?



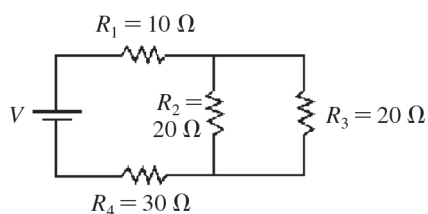
- 16) What is the equivalent resistance between points A and B of the network shown in the figure?



- 17) What is the equivalent resistance of the circuit shown in the figure? The battery is ideal and all resistances are accurate to 3 significant figures.



- 18) A 7.0-Ω resistor is connected across the terminals of a battery having an internal emf of 10 V. If 0.50-A current flows, what is the internal resistance of the battery?
- 19) Four resistors having resistances of 20 Ω, 40 Ω, 60 Ω, and 80 Ω are connected in series across an ideal 50-V dc source. What is the current through each resistor?
- 20) If $V = 40$ V and the battery is ideal, what is the potential difference across R_1 in the figure?



Answer Key

Testname: CH19_ELECTRIC_CIRCUITS

- 1) B, D, E
- 2) D
- 3) C
- 4) A, B
- 5) C
- 6) A
- 7) E
- 8) B
- 9) D
- 10) B
- 11) C
- 12) B
- 13) (a) $1.98\ \mu\text{F}$ (b) $20.00\ \mu\text{F}$
- 14) $4.7\ \text{V}$
- 15) $3.3\ \mu\text{F}$
- 16) $16\ \Omega$
- 17) $392\ \Omega$
- 18) $13\ \Omega$
- 19) $0.25\ \text{A}$
- 20) $8.0\ \text{V}$