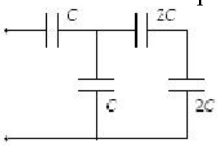
Name: ________________________ Class: ___________________ Date: __________ ID: A

# AP Physics 2 - Chapter 17 - 18 Practice

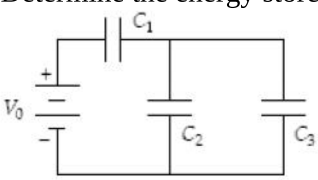
**Multiple Choice**
*Identify the choice that best completes the statement or answers the question.*

____ 1. Determine the equivalent capacitance of the combination shown when $C$ = 45 «F.



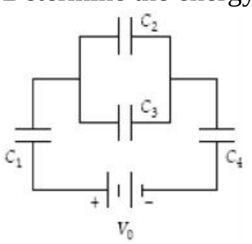

a. 36 «F  b. 32 «F  c. 34 «F  d. 30 «F  e. 38 «F

____ 2. Determine the energy stored in $C_2$ when $C_1$ = 15 «F, $C_2$ = 10 «F, $C_3$ = 20 «F, and $V_0$ = 18 V.



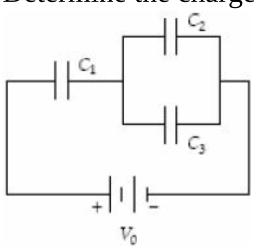

a. 0.72 mJ  b. 0.32 mJ  c. 0.50 mJ  d. 0.18 mJ  e. 1.60 mJ

____ 3. Determine the energy stored by $C_4$ when $C_1$ = 20 «F, $C_2$ = 10 «F, $C_3$ = 14 «F, $C_4$ = 30 «F, and $V_0$ = 45 V.



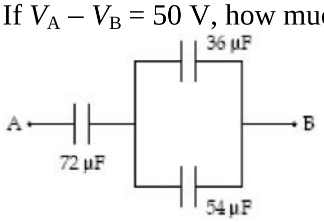

a. 3.8 mJ  b. 2.7 mJ  c. 3.2 mJ  d. 2.2 mJ  e. 8.1 mJ

____ 4. Determine the charge stored by $C_1$ when $C_1$ = 20 «F, $C_2$ = 10 «F, $C_3$ = 30 «F, and $V_0$ = 18 V.




a. 0.37 mC  b. 0.24 mC  c. 0.32 mC  d. 0.40 mC  e. 0.50 mC

____ 5. If $V_A - V_B$ = 50 V, how much energy is stored in the 36-«F capacitor?




a. 50 mJ  b. 28 mJ  c. 13 mJ  d. 8.9 mJ  e. 17 mJ

____ 6. A parallel plate capacitor of capacitance $C_0$ has plates of area $A$ with separation $d$ between them. When it is connected to a battery of voltage $V_0$, it has charge of magnitude $Q_0$ on its plates. It is then disconnected from the battery and the plates are pulled apart to a separation $2d$ without discharging them. After the plates are $2d$ apart, the new capacitance and the potential difference between the plates are

a. $\frac{1}{2}C_0, \frac{1}{2}V_0$ b. $\frac{1}{2}C_0, V_0$ c. $\frac{1}{2}C_0, 2V_0$ d. $C_0, 2V_0$ e. $2C_0, 2V_0$

____ 7. A parallel plate capacitor of capacitance $C_0$ has plates of area A with separation $d$ between them. When it is connected to a battery of voltage $V_0$, it has charge of magnitude $Q_0$ on its plates. It is then disconnected from the battery and the space between the plates is filled with a material of dielectric constant 3. After the dielectric is added, the magnitudes of the charge on the plates and the potential difference between them are

a. $\frac{1}{3}Q_0, \frac{1}{3}V_0$. b. $Q_0, \frac{1}{3}V_0$. c. $Q_0, V_0$. d. $Q_0, 3V_0$. e. $3Q_0, 3V_0$.

____ 8. A parallel plate capacitor of capacitance $C_0$ has plates of area A with separation $d$ between them. When it is connected to a battery of voltage $V_0$, it has charge of magnitude $Q_0$ on its plates. It is then disconnected from the battery and the space between the plates is filled with a material of dielectric constant 3. After the dielectric is added, the magnitudes of the capacitance and the potential difference between the plates are

a. $\frac{1}{3}C_0, \frac{1}{3}V_0$. b. $C_0, \frac{1}{3}V_0$. c. $C_0, V_0$. d. $3C_0, \frac{1}{3}V_0$. e. $3C_0, 3V_0$.

____ 9. An electric heater is constructed by applying a potential difference of 110 V across a wire with a resistance of 5.0 Ω. What is the power rating of the heater?

a. 2.0 kW b. 2.4 kW c. 1.7 kW d. 1.5 kW e. 60 kW

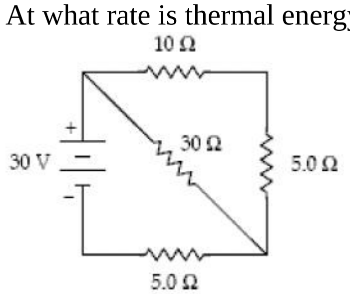
____ 10. A conductor of radius $r$, length $\ell$ and resistivity ° has resistance $R$. What is the new resistance if it is stretched to 4 times its original length?

a. $\frac{1}{16}R$ b. $\frac{1}{4}R$ c. $R$ d. $4R$ e. $16R$

____ 11. A small bulb is rated at 7.5 W when operated at 125 V. Its resistance (in ohms) is

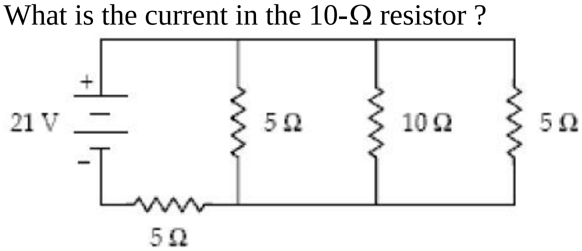
a. 0.45. b. 7.5. c. 17. d. 940. e. 2 100.

____ 12. At what rate is thermal energy generated in the 30-Ω resistor?




a. 20 W b. 27 W c. 60 W d. 13 W e. 30 W

____ 13. What is the current in the 10-Ω resistor ?

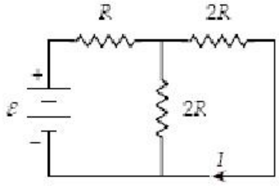



a. 0.60 A b. 3.0 A c. 1.2 A d. 2.4 A e. 0.30 A

____ 14. When a 20-V emf is placed across two resistors in series, a current of 2.0 A is present in each of the resistors. When the same emf is placed across the same two resistors in parallel, the current through the emf is 10 A. What is the magnitude of the greater of the two resistances?

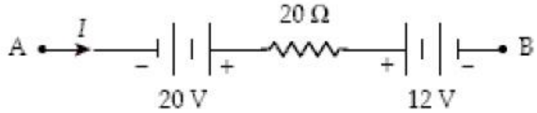
a. 7.2 Ω  b. 7.6 Ω  c. 6.9 Ω  d. 8.0 Ω  e. 2.8 Ω

____ 15. Determine £ when $I$ = 0.50 A and $R$ = 12 Ω.



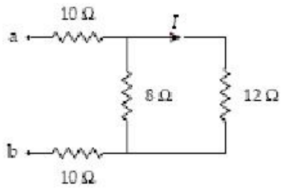

a. 12 V  b. 24 V  c. 30 V  d. 15 V  e. 6.0 V

____ 16. What is the potential difference $V_B - V_A$ when the $I$ = 1.5 A in the circuit segment below?



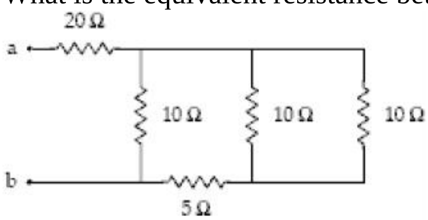

a. +22 V  b. –22 V  c. –38 V  d. +38 V  e. +2.0 V

____ 17. If $I$ = 0.40 A in the circuit segment shown below, what is the potential difference $V_a - V_b$?




a. 31 V  b. 28 V  c. 25 V  d. 34 V  e. 10 V

____ 18. What is the equivalent resistance between points a and b?

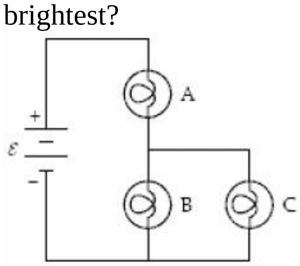



a. 14 Ω  b. 8.0 Ω  c. 6.0 Ω  d. 25 Ω  e. 40 Ω

____ 19. If 480 C pass through a 4.0-Ω resistor in 10 min, what is the potential difference across the resistor?

a. 3.6 V  b. 2.8 V  c. 2.4 V  d. 3.2 V  e. 5.0 V

____ 20. The circuit below contains three 100-watt light bulbs. The emf £ = 110 V. Which light bulb(s) is(are) the brightest?




a. A  c. C  e. All are equally bright.
b. B  d. B and C

# AP Physics 2 - Chapter 17 - 18 Practice
# Answer Section

## MULTIPLE CHOICE

1. D
2. D
3. D
4. B
5. D
6. C
7. B
8. D
9. B
10. E
11. E
12. D
13. A
14. A
15. B
16. B
17. C
18. D
19. D
20. A