

**ENGG104 Tutorial 2 extra Problems (revision)**

Name \_\_\_\_\_

Student Number \_\_\_\_\_

**TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.**

- 1) Resistance decreases as the cross-sectional area of a conductor increases. 1) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 2) Doubling the area of a conductor 2) \_\_\_\_\_  
A) cuts the resistance in half. B) decreases resistance by a factor of 4.  
C) increases resistance by a factor of 4. D) doubles the resistance.

**TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.**

- 3) Resistance is directly proportional to the length of a conductor. 3) \_\_\_\_\_  
4) A 1000 watt load that operates for one hour consumes the same amount of energy as a 100 watt load that operates for 10 hours. 4) \_\_\_\_\_

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

- 5) If an electric circuit requires 1 amp at 50 volts, how much current will it require if the voltage is increased to 75 volts? 5) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 6) The current consumed by a digital wristwatch is 20  $\mu\text{A}$ . What is the equivalent resistance of the watch if it is powered by a 1.5 V battery? 6) \_\_\_\_\_  
A) 75  $\text{k}\Omega$  B) 75  $\Omega$  C) 33.3  $\text{k}\Omega$  D) 30  $\mu\Omega$

**TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.**

- 7) One *watt* is the same as one joule per second. 7) \_\_\_\_\_  
8) Power is directly proportional to the resistance times the current squared. 8) \_\_\_\_\_

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

- 9) What is the power dissipated by a 1.2 Kilohm resistor if the voltage drop across the resistor is 56 volts? 9) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 10) How many joules of energy will a 10 watt lamp dissipate in one minute? 10) \_\_\_\_\_  
A) 3600 joules B) 10 joules C) 600 joules D) 60 joules  
11) One kilowatt-hour is equivalent to 11) \_\_\_\_\_  
A)  $6.0 \times 10^4$  joules B)  $1.0 \times 10^3$  joules C)  $6.0 \times 10^3$  joules D)  $3.6 \times 10^6$  joules

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

- 12) Using Ohm's Law, find V when the current  $I = 4.2$  milliamps and  $R = 1.5$  Kilohms. 12) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 13) The statement that "the algebraic sum of voltage drops around a closed electrical circuit must equal zero" is: 13) \_\_\_\_\_  
A) Coulomb's voltage law B) Ohm's voltage law  
C) Kirchhoff's voltage law D) Faraday's voltage law

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

- 14) The voltage measured across an shorted component in a series circuit is equal to 14) \_\_\_\_\_  
\_\_\_\_\_.

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 15) If the voltage dropped across a resistor increases by a factor of 10, the power dissipated by the resistor 15) \_\_\_\_\_  
A) decreases. B) increases by a factor of 100.  
C) increases by a factor of 20. D) increases by a factor of 10.

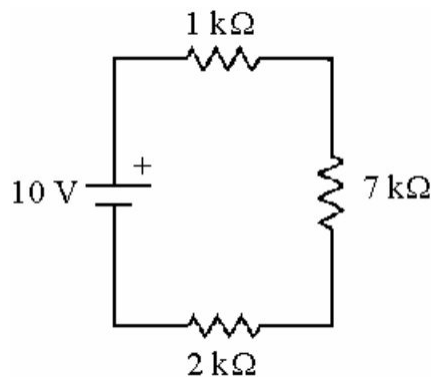


Figure 5.1

- 16) See Figure 5.1. The total resistance in this circuit is 16) \_\_\_\_\_  
A)  $2\text{ k}\Omega$  B)  $7\text{ k}\Omega$  C)  $1\text{ k}\Omega$  D)  $10\text{ k}\Omega$

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

- 17) What is the total resistance of thirty  $6\text{ ohm}$  resistors connected in series? 17) \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 18) A series circuit dissipates a total of  $56.25\text{ mW}$  of power with a current of  $3.75\text{ mA}$ . If  $R_2$  dissipates  $21.09\text{ mW}$  of power, what is the value of  $R_1$ ? 18) \_\_\_\_\_  
A)  $2000\text{ ohms}$  B)  $1000\text{ ohms}$  C)  $2500\text{ ohms}$  D)  $1500\text{ ohms}$

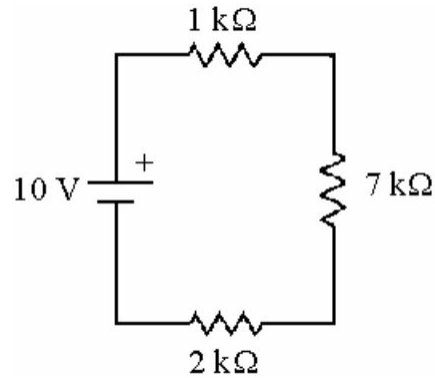


Figure 5.1

19) See Figure 5.1. The total current flowing from the battery is

A) 1 mA

B) 5 mA

C) 1.43 mA

D) 10 mA

19) \_\_\_\_\_

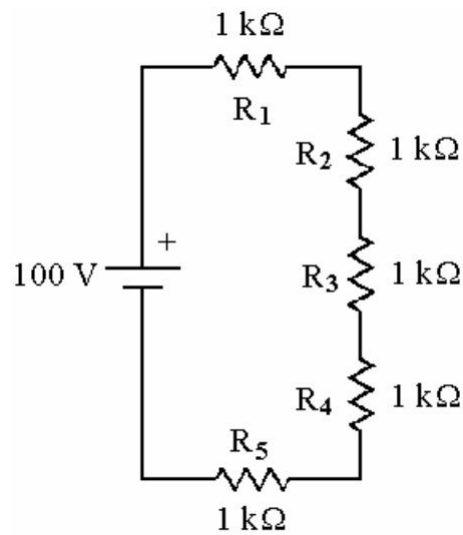


Figure 5.2

20) See Figure 5.2. If  $R_3$  is short circuited, how much power is dissipated by  $R_5$ ?

A) 2.5 W

B) 625 mW

C) 325 mW

D) 1.25 W

20) \_\_\_\_\_

21) Given a series circuit containing resistors of different values, which statement is not true?

A) The total resistance is the sum of the value of the resistors.

B) The sum of the voltage drops across each resistive element will be equal to the source voltage.

C) The current through each resistor is the same.

D) The voltage drop across each resistor will be the same.

21) \_\_\_\_\_

**TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.**

22) The sum of the voltage drops in a series circuit is always equal to the applied voltage.

22) \_\_\_\_\_