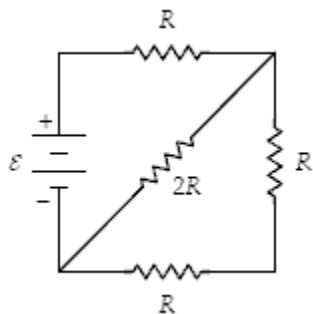


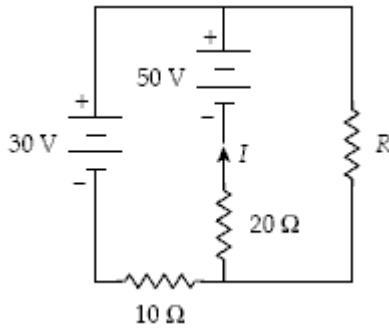
## Physics 210 Multiple Choice Problems for week 7

- \_\_\_\_\_ 1. If  $5.0 \times 10^{21}$  electrons pass through a  $20\text{-}\Omega$  resistor in 10 min, what is the potential difference across the resistor?
- 21 V
  - 32 V
  - 27 V
  - 37 V
  - 54 V
- \_\_\_\_\_ 2. The temperature coefficient of resistivity of iron is  $5.0 \times 10^{-3} / ^\circ\text{C}$ ; that of carbon is  $-0.50 \times 10^{-3} / ^\circ\text{C}$ . When an iron wire and a carbon rod, each having the same  $10\ \Omega$  resistance at  $20^\circ\text{C}$ , are cooled from that temperature to  $-80^\circ\text{C}$ , the new ratio of the resistance of the carbon rod to the resistance of the iron wire at the lower temperature is
- 0.10.
  - +1.9.
  - +2.1.
  - 10.
  - +10.
- \_\_\_\_\_ 3. Light bulb A is rated at 60 W and light bulb B is rated at 100 W. Both are designed to operate at 110 V. Which statement is correct?
- The 60 W bulb has a greater resistance and greater current than the 100 W bulb.
  - The 60 W bulb has a greater resistance and smaller current than the 100 W bulb.
  - The 60 W bulb has a smaller resistance and smaller current than the 100 W bulb.
  - The 60 W bulb has a smaller resistance and greater current than the 100 W bulb.
  - We need to know the resistivities of the filaments to answer this question.
- \_\_\_\_\_ 4. At what rate is thermal energy being generated in the  $2R$ -resistor when  $\varepsilon = 12\ \text{V}$  and  $R = 3.0\ \Omega$ ?

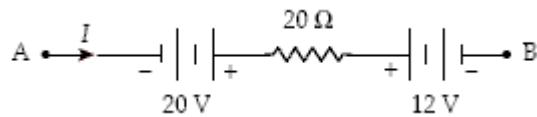


- 12 W
- 24 W
- 6.0 W
- 3.0 W
- 1.5 W

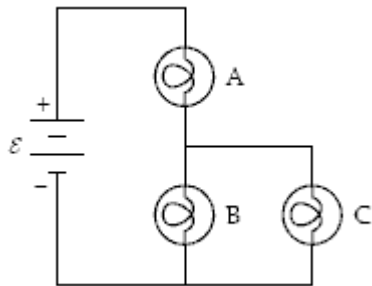
5. Determine the magnitude and sense (direction) of the current in the  $10\text{-}\Omega$  resistor when  $I = 1.8\text{ A}$ .



- 1.6 A right to left
  - 1.6 A left to right
  - 1.2 A right to left
  - 1.2 A left to right
  - 1.8 A left to right
6. What is the potential difference  $V_B - V_A$  when the  $I = 1.5\text{ A}$  in the circuit segment below?



- +22 V
  - 22 V
  - 38 V
  - +38 V
  - +2.0 V
7. The circuit below contains three 100 watt light bulbs. The emf  $\mathcal{E} = 110\text{ V}$ . Which light bulb(s) is(are) the brightest?



- A
- B
- C
- B and C
- All three are equally bright.

- \_\_\_\_\_ 8. An electron has a velocity of  $6.0 \times 10^6$  m/s in the positive  $x$  direction at a point where the magnetic field has the components  $B_x = 3.0$  T,  $B_y = 1.5$  T, and  $B_z = 2.0$  T. What is the magnitude of the acceleration of the electron at this point?
- $2.1 \times 10^{18}$  m/s<sup>2</sup>
  - $1.6 \times 10^{18}$  m/s<sup>2</sup>
  - $2.6 \times 10^{18}$  m/s<sup>2</sup>
  - $3.2 \times 10^{18}$  m/s<sup>2</sup>
  - $3.7 \times 10^{18}$  m/s<sup>2</sup>
- \_\_\_\_\_ 9. An electron moving in the positive  $x$  direction experiences a magnetic force in the positive  $z$  direction. If  $B_x = 0$ , what is the direction of the magnetic field?
- negative  $y$  direction
  - positive  $y$  direction
  - negative  $z$  direction
  - positive  $z$  direction
  - negative  $x$  direction
- \_\_\_\_\_ 10. A 2.0-C charge moves with a velocity of  $(2.0\mathbf{i} + 4.0\mathbf{j} + 6.0\mathbf{k})$  m/s and experiences a magnetic force of  $(4.0\mathbf{i} - 20\mathbf{j} + 12\mathbf{k})$  N. The  $x$  component of the magnetic field is equal to zero. Determine the  $y$  component of the magnetic field.
- 3.0 T
  - +3.0 T
  - +5.0 T
  - 5.0 T
  - +6.0 T

## Physics 210 Multiple Choice Problems for week 7

### Answer Section

#### MULTIPLE CHOICE

- |            |        |
|------------|--------|
| 1. ANS: C  | PTS: 1 |
| 2. ANS: C  | PTS: 1 |
| 3. ANS: B  | PTS: 1 |
| 4. ANS: C  | PTS: 1 |
| 5. ANS: A  | PTS: 1 |
| 6. ANS: B  | PTS: 1 |
| 7. ANS: A  | PTS: 1 |
| 8. ANS: C  | PTS: 1 |
| 9. ANS: A  | PTS: 1 |
| 10. ANS: B | PTS: 1 |