Answer Key for Evaluation Exercise:

1. The only fundamental force controllable at room temperature is the Electromagnetic force
2. The unit of force in the SI (metric) system is the Newton (N)
3. The conversion between lbf and newtons is 1 N = 0.2248 lbf
4. Force is a vector quantity
5. An iron (Fe) ion cannot have 26 orbiting electrons and be an ion
6. Two positive charges are going to experience a force of repulsion between them
7. How many protons are required to have a coulomb of charge? 6.24e18
8. One coulomb of Fe+++ ions consists of 2.08e18 particles.
9. The energy required to raise a 4 kg weight (39.2 N) to a height of 4 metres is 156.8 joules
10. The conversion between joules and engineering calories is 1 cal = 4.187 joules
11. The conversion between joules and BTU's is 1 BTU = 1055 joules
12. How many joules are in a kilowatt-hour 3,600,000 joules/kWhr
13. The average power in problem 9 if the process takes 10 seconds is 15.68 watts
14. A fully loaded 15 hp motor with a 90% efficiency consumes 12,433 watts
15. The two perspectives of current flow are electron flow and conventional current flow
16. The fundamental SI units for volts (V) are joules/coulomb
17. The fundamental SI units for electric power are joules/second
18. Four requirements for corrosion to occur are: anode, cathode, ion path, electron path
19. What chemical process occurs at the cathode - reduction (gaining electrons)
20. What chemical process occurs at the anode - oxidation (losing electrons)