**Study questions for Chapter 19 – Oxidation/Reduction**

*(just a guide, not meant to represent all topics on the test)*

1. In redox reactions involving acids or bases, how are oxygen atoms generally balanced?

2. What is the oxidation number for each atom in NH4+?

3. A redox reaction can easily be explained as (select best answer):

a. the breakdown of glucose in cells

b the temporary storage of cellular energy

c. forming a bond by sharing electrons

d. an attraction between opposite charges

e. transferring electrons between reactants

4. Which equation is correctly labeled as either oxidation or reduction?

a. NaCl + AgNO3 ---> AgCl + NaNO3 (reduction)

b. Mn2+ ---> MnO4 -  (reduction)

c. H2S ---> S + 2e- + 2H+ (oxidation)

d. NH3 + HCl ---> NH4+ + Cl- (oxidation)

5. How are oxidation and reduction different?

 a. Reduction is a reaction that removes an electron from a substance; oxidation is a reaction that adds electrons to a substance.

b. Reduction is when the total number of electrons increases in a reaction; oxidation is when the total number of electrons decreases in a reaction.

c. Oxidation is a reaction that removes an electron from a substance; reduction is a reaction that adds electrons to a substance.

d. Oxidation is when the total number of electrons increases in a reaction; reduction is when the total number of electrons decreases in a reaction.

6. Which of the compounds, CO or CO2, contain carbon in its most reduced form?

7. When electrons are gained it is called:

 a: oxidation b: reduction c: redox d: none of these

8. A substance that loses electrons is called the oxidizing/reducing agent?

9. Identify the elements being oxidized and reduced in the following two reactions:

a. Cr+ + Sn4+ → Cr3+ + Sn2+

b. 2 As + 3 Cl2 → 2 AsCl3

10. Write the balanced half-reactions of the following reaction:

 2 H+ + H2O2 + 2 Fe2+  2 Fe3+ + 2 H2O (in acidic solution)

11. For a galvanic cell, the cathode is the positive/negative electrode?

12. For a galvanic cell, the anode is the positive/negative electrode?

13. At the cathode, oxidation/reduction takes place?

14. At the anode, oxidation/reduction takes place?

15. In an oxidation reaction, electrons appear on the left/right side of the half-reaction?

16. In a reduction reaction, electrons appear on the left/right side of the half-reaction?

17. What does galvanized mean?

18. What is the Faraday constant?

19. Consider the following reaction:

 a. the oxidizing agent is \_\_\_\_\_\_\_\_\_\_

 b. the reducing agent is \_\_\_\_\_\_\_\_\_

 c. What is oxidized \_\_\_\_\_\_\_\_\_\_\_

 d. What is reduced \_\_\_\_\_\_\_\_\_\_

Using the table of reduction potentials in the textbook (table 20.1, which will be provided for the exam) determine:

21. The strongest oxidizing agent in the table \_\_\_\_\_\_\_\_\_\_\_\_

22. The weakest reducing agent in the table \_\_\_\_\_\_\_\_\_\_

23. Predict if Cd will react with Ni2+ \_\_\_\_\_\_\_\_\_\_\_\_

24. Predict if Sn will react with Pb2+ \_\_\_\_\_\_\_\_\_\_\_\_\_

25. Predict if Co will react with Cr3+ \_\_\_\_\_\_\_\_\_\_\_\_\_

26. Calculate E°cell for the reaction:

 Ni2+ + Zn 🡪 Ni + Zn2+