Exam 2  Chapter Review Topics

✓ The problem numbers at the end of each question are only a guide to what sort of text problem may be related.
✓ Be sure to review quizzes, worksheets, notes, text, and homework.
✓ Be able to work relevant problems at the end of the chapter for extra practice.
✓ Be prepared to draw Mental Models of chemical reactions and phenomena.
✓ Below are some guidelines of what will be emphasized but you should be able to discuss anything from the chapters or lectures unless otherwise specified in lecture.
✓ You will be given a periodic table.
✓ You must bring your own calculator. Sharing of calculators during exams will not be allowed. You will also need a pencil or pen, and a form 882 Scantron (50 questions).

Keys to studying chemistry

➢ Use frequent but short study periods, rather than long hours just before an exam
➢ Practice! Chemistry uses lots of terms and can seem like a foreign language.
➢ Practice problems in writing, not just in your head or calculator.
➢ Give yourself practice tests that are timed, to simulate an exam setting.
➢ Read each problem carefully to determine what is being asked, make a plan for solving the problem, check the answer to see if it is reasonable.

Problem solving is a performance art, like acting or tennis. If you want to perform well, you must practice solving problems.

Chapter 3:
1. Can you identify the limiting reactant in a chemical reaction? (1, 2, 8, 64, 67, 72, 73, 74, 75)
2. Can you determine empirical and molecular formulas based on mass % or combustion analysis results? (50, 52, 53, 54)

Chapter 4:
3. Can you define Molarity and its units? (59)
4. Do you know how to calculate the molarity of a solution and given the mass of solute and volume of solution? If given the molarity and volume, can you calculate mass of solute needed and describe how to make the solution? (61, 63, 67, 73)
5. Do you know how to use molarity/volume in stoichiometry problems? (79, 81, 83, 87)
6. Can you identify what compounds are likely to be electrolytes? (19, 29, 37)
7. Distinguish and compare the equations for dissociation and ionization reactions.
8. What is the difference between strong and weak electrolytes, especially at the same concentration? (3, 5, 33, 37)
9. Can you write molecular (principle), ionic and net ionic equations? What do you do if a solid or a gas or H₂O shows up in the principle reaction? (24, 53, 54)
10. Can you use the solubility rules (web) to predict if a ppt will form in aqueous solution? (19, 21, 23, 27)
11. Describe different ways that acids and bases make ions in water? (see #6; 33)
12. Can you identify the strong acids by name and formula? What about the 967 common weak acids?
13. What is the mental model for a solution of a weak acid or a weak base? (see #8; 3, 4)
14. Can you predict the products when an acid reacts with a base, or a carbonate salt or ammonia (are these bases too)? (39, 41 b, 43a)
15. Define oxidation, reduction, neutralization. (45, 46, 47)
16. Can you determine which reactant in a chemical reaction has been oxidized or reduced? 49, 51, 53)
17. Use the activity series to determine if a chemical reaction occurs between a metal and the ions of a different metal: (55, 56)

Chapter 16 (section 3 and 4):
Skip all references to $K_a$ and $K_w$ in these sections. Focus on what was discussed in lecture.
18. Can you explain how someone who said that water is an acid because it makes $H^+$ is partially correct, while someone else who said that water is a base is also partially correct? (16.29)
19. Can you calculate pH from concentrations of strong acids? 16.31
20. Do you know which solution is more acidic, one with pH of 3 or one with pH of 4?