Instructions: Near the entrance of the room, <u>please sign your name into the sign-in sheet</u>. A copy of this review is available on our website at <u>https://teachingcenter.ufl.edu/tutoring/test-reviews/</u>. If you would like, feedback forms will be available for you to fill at near the end of the review. Please do not hesitate to speak up if you have any questions or if any issues arise.

1. **A block of aluminum (d=2.70 g/cm³) is placed in a bucket of water, and it displaces 30 mL of water. What is the mass of the block?**
   (1) 26 g   **(2) 48 g**   **(3) 12 g**   **(4) 81 g**   **(5) 11 g**

2. **Simplify the following expression:**

   $$\frac{100.6-(42.1+50.0)}{2.41}$$

   (1) 3.52   **(2) 3.5**   **(3) 3.50 (4) 4**   **(5) 3.526970954356846**

3. **There exist only two stable isotopes of Bromine. Bromine-79 has a mass of 78.92 and Bromine-81 has a mass of 80.92. What is the percent abundance of Bromine-81?**
   (1) 50.8%   **(2) 49.2%**   **(3) 64.1%**   **(4) 50%**   **(5) 83%**

4. **Which of the following formula and name pairs are correct?**
   I: NO, nitrogen oxide   **II: $KClO_2$, potassium chlorite**
   III: H_3PO_3, phosphoric acid   **IV: SrF_2, strontium fluoride**
   (1) I and IV   **(2) II and III**   **(3) I and III**   **(4) II and IV**   **(5) I, II, III, and IV**

5. **A jar contains 120 g of water. How many oxygen atoms are inside the jar?**
   (1) 8.2 mol   **(2) 15 mol**   **(3) 13.3 mol**   **(4) 6.7 mol**   **(5) 7.5 mol**

6. **A 2.06 g sample of $AgNO_3 \cdot xH_2O$ is dissolved in an aqueous solution of excess NaCl. The resulting AgCl precipitate is filtered off and is found to have a mass of 1.32 g. What is the value of x in $AgNO_3 \cdot xH_2O$?**
   (1) one (2) two (3) three   **(4) four**   **(5) five**

7. **20 g of iron reacts with excess bromine to form 64.1 g of iron(II) bromide. What is the percent yield of the reaction?**
   (1) 50.8%   **(2) 49.2%**   **(3) 64.1%**   **(4) 50%**   **(5) 83%**

8. **How many grams of oxygen would be needed to completely combust 1 kg of octane (C_8H_{18})?**
   (1) 2 kg   **(2) 2.5 kg**   **(3) 3 kg**   **(4) 3.5 kg**   **(5) 4 kg**

9. **135 g of Zinc metal reacts with 250 mL of 12 M hydrochloric acid in order to form zinc chloride and hydrogen gas according to the following balanced equation:**
   $$Zn + 2HCl \rightarrow ZnCl_2 + H_2$$
   Which is the limiting reactant? Is it the oxidizing or the reducing agent?
   (1) Zn; oxidizing agent (2) Zn; reducing agent (3) HCl; oxidizing agent (4) HCl; reducing agent

10. **How much water should a chemist add to a 10 mL solution of 10 M H_2SO_4 in order to dilute it to 2 M?**
    (1) 50 mL   **(2) 20 mL**   **(3) 40 mL**   **(4) 10 mL**   **(5) 8 mL**

11. When 88.10 grams of butyric acid was combusted, 176.0 grams of carbon dioxide and 72.08 grams of water were produced. Based on this information, which of the following is the most likely formula for butyric acid?

(1) $C_4H_4O_2$ (2) $C_4H_4O_3$ (3) $C_3H_6O_3$ (4) $C_2H_4O_2$ (5) $C_4H_8O_2$

12. A titration is done with NaOH and 250mL of 3M HCl. If 200mL of NaOH is needed to reach the equivalence point, what is the molarity of the NaOH solution?

(1) 3.75 M   (2) 3.33 M   (3) 2.75 M   (4) 3.0 M   (5) 1.67 M

13. An aqueous solution contains Cu^+, Ca^{2+}, and Fe^{3+}. Which of the following compounds could be added to this solution to selectively precipitate the Ca^{2+} ion, but not the other ions?

(1) NaF   (2) $(NH_4)_2S$ (3) KOH   (4) $Al(NO_3)_3$ (5) $ZnCl_2$

14. Which of the following reactions are considered redox reactions?

        I: $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
        II: $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$
        III: $2C_6H_{14} + 19O_2 \rightarrow 12CO_2 + 14H_2O$
        IV: $2KOH + H_2SO_4 \rightarrow 2H_2O + K_2SO_4$

(1) I and IV   (2) II and III   (3) I and III   (4) II and IV   (5) I, II, III, and IV

15. Which elements are oxidized in each of the following two reactions? Answer in order.

        I: $5SO_4^{2-} + 2Mn^{2+} + 3H_2O \rightarrow 5SO_3^{2-} + 2MnO_4^- + 6H^+$
        II: $2NO_2 + 7H_2 \rightarrow 2NH_3 + 4H_2O$

(1) S; H   (2) S; N   (3) Mn; H   (4) Mn; N   (5) H; O