Student name:

Circle the best answer to each of the following questions (30 minutes)

| 1 in. = 2.54 cm (exactly) | 1 L = 1000 cm ³ | 1 kg = 2.205 lb |
|-------------------------------------|--|--|
| 1 mile = 5280 ft = 1.609 km | 1 gal = 4 qt = 8 pt = 3.785 L | 1 lb = 16 oz = 453.6 g |
| 1 cal = 4.184 J 1 Cal = 1000 cal | 1 mole = 6.022 x 10 ²³ "things" | C (water) = 4.18 J/g•°C C (copper) = 0.385 J/g•°C |

1) How many electrons does the Ru ion have in compound $Ru(AsO_4)_2$?

| A) 44 | C) 48 | E) 40 |
|-------|-------|-------|
| B) 38 | D) 50 | |

2) Report the answer to this calculation with the correct significant figures: (0.45)(145.4) + (0.70)(128.4)A) 1.5×10^2 B) 1.6×10^2 C) 155D) 155.31D) 155.3

| 3) | How many μ g are in 6.0 x 10 ⁻⁵ Mg? | |
|----|--|------------------------------|
| | A) 6.0 x 10 ⁻⁷ μg | C) 6.0 x 10 ⁷ μg |
| | B) 6.0 x 10 ⁵ μg | D) 6.0 x 10 ⁻⁵ µg |

E) 4.0 x 10⁹ μg

A sample of an unknown material has a mass of 38 g and a volume of 6.5 cm³. What is the density of the material in lb/in³?
A) 5.8 lb/in³
B) 0.033 lb/in³
C) 4.7 lb/in³
D) 0.21 lb/in³

Student name:

5) A 20.0 g sample of copper is heated to 203°C and dropped into a sample of water at 25.0°C. If the final temperature of the water is 39.0°C, what mass of water (to 3 significant figures) was used? A) 80.0 g C) 0.165 g E) 35.0 g D) 21.6 g B) 0.0233 g

- E) 3.8 x 10²⁷ atoms

Student name:

8) A 1.45-g sample of phosphorus burns in air and forms 2.57 g of a phosphorus oxide. What is the empirical formula of the oxide.
A) PO
B) PO₄
C) P₂O₃
D) P₂O₇
E) P₃O₄

- 9) A mixture of 3.0 g of hydrogen and 8.0 grams of oxygen is ignited, forming water. After the reaction is complete, how much of the excess reactant (in grams) will remain?
 A) 2.0 g H₂
 C) 6.0 g O₂
 E) 9.0 g H₂O
 - A) $2.0 \text{ g} \text{ H}_2$ C) $6.0 \text{ g} \text{ O}_2$ B) $1.0 \text{ g} \text{ H}_2$ D) $2.0 \text{ g} \text{ O}_2$

- 10) What is the maximum mass (in grams) of gas that can be created when 5.0 g of hydrochloric acid react with 5.0 g of potassium sulfide?
 - A) 1.8 g C) 2.3 g B) 3.2 g D) 5.0 g

E) 1.5 g