

Answer the following questions by marking the **BEST** answer on the answer sheet.

1. How many significant figures does the number 0.002014900 have?
 a. 7 b. 9 c. 5 d. 10
2. Several groups of students from Texas High were hired by Polymer Company, Inc. to mass 33.0 g of a sample of polypropylene. Their data is listed below.

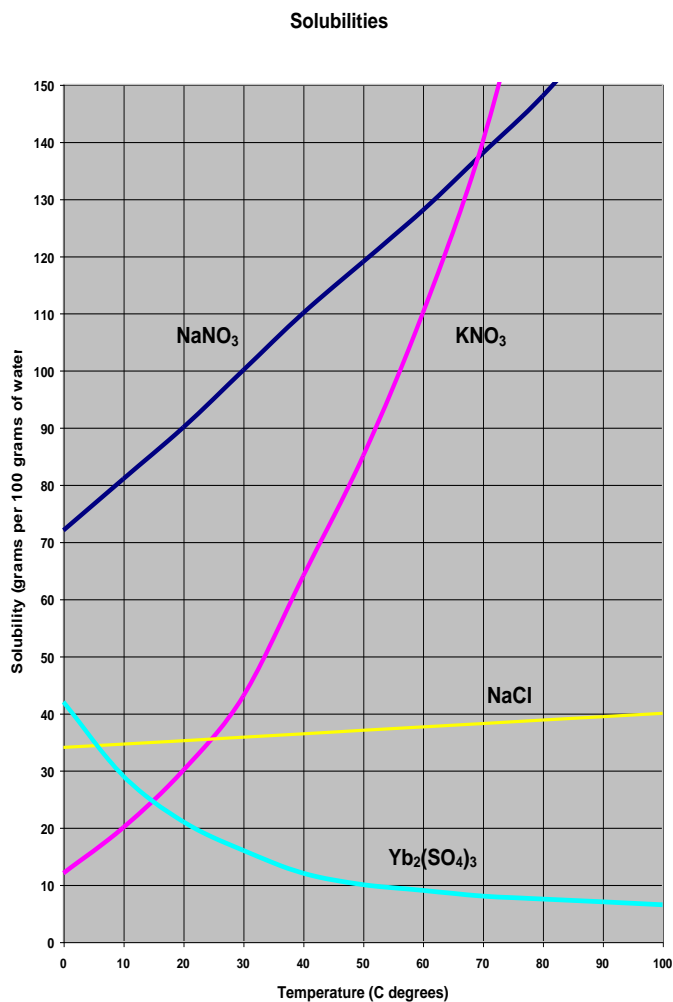
Group A:	35.2 g	35.3 g	35.3 g	35.2 g
Group B:	33.5 g	33.5 g	33.4 g	33.5 g
Group C:	40.5g	53.5 g	35.3 g	30.2 g

Which group of students had good Precision and poor Accuracy?

- a. Group A b. Group B c. Group C
3. Convert 20°F to Kelvin
 a. 280 K b. 266 K c. 302 K d. 251 K
4. Which properties are characteristic of elements classified as nonmetals?
 a. shiny appearance b. brittle c. malleable d. both a and c
5. A Texas High student took a beaker containing a colorless liquid and evaporated the liquid. After the liquid was evaporated, she observed a white residue in the beaker. From these observations, she would conclude that the original liquid was a
 a. compound. b. element. c. mixture. d. pure substance.
6. Stability is a characteristic of
 a. a SOLUTION. b. a COLLOID.
 c. a SUSPENSION. d. BOTH a and b
 e. BOTH b and c
7. Food digesting in the stomach is an example of a
 a. chemical property. b. chemical change.
 c. physical property. d. physical change.
8. A measurement of how tightly packed the particles in a substance are is
 a. weight. b. mass. c. volume. d. density.
9. The insoluble product of a reaction that falls to the bottom of container is the
 a. precipitate. b. filtrate. c. extraction. d. residue.
10. Which of the following is true about the isotope ${}_{13}^{28}\text{Al}$?
 a. 13 neutrons b. 13 electrons c. atomic mass of 27 d. 15 protons
11. Which is true about the compound HgCl_2 ?
 a. It is a binary compound. b. It contains 2 nonmetals.
 c. It contains a polyvalent ion. d. BOTH a and c
12. Which of the following is the name of the compound with the formula $\text{Ni}_2(\text{SO}_4)_3$?
 a. Nickel (II) sulfide b. Nickel (III) sulfide
 c. Nickel (II) sulfate d. Nickel (III) sulfate
13. Which of the following is the formula for the compound calcium carbonate?
 a. Ca_2C b. $\text{Ca}(\text{HCO}_3)_2$ c. $\text{Ca}(\text{CO}_3)_2$ d. CaCO_3

14. Which of the following is the formula for the compound Mercury (II) phosphate?
a. $\text{Mg}_3(\text{PO}_4)_2$ b. $\text{Mg}_2(\text{PO}_4)_3$ c. $\text{Hg}_3(\text{PO}_4)_2$ d. $\text{Hg}_2(\text{PO}_4)_3$
15. As the temperature of a gas decreases, the energy of the gas molecules
a. increases. b. decreases. c. remains the same.
16. Which temperature is the highest?
a. 100°C b. 100 K c. 0°C d. 0 K
17. Which of the following is correct about STP?
a. standard time and pressure is midnight and 1 atm
b. standard temperature and pressure is 0 K and 1 atm
c. standard time and proportion is noon and 1 mol
d. standard temperature and pressure is 0°C and 1 atm
18. What is the molar mass of $(\text{NH}_4)_2\text{CO}_3$?
a. 96 g/mol b. 46 g/mol c. 64 g/mol d. 82 g/mol
19. All of the following are pressure units **EXCEPT**
a. atmosphere. b. pascal. c. STP. d. kPa.
20. Convert 935mm Hg to atmospheres.
a. 935 atm b. 7.11 atm c. 1.23 atm d. 0.813 atm
21. The molar mass of $\text{Ca}_3(\text{PO}_4)_2$ is closest to
a. 310 g. b. 246 g. c. 167 g. d. 87 g.
22. Which of the following describes one mole of iron?
a. 6.02×10^{23} atoms b. 55.8 g Fe
c. both a and b d. neither a or b
23. If the total gas pressure is 99.2 kPa and the water vapor pressure is 2.6 kPa, what is the partial pressure of the nitrogen gas that is mixed with the water vapor?
a. 38.1 kPa b. 96.6 atm c. 101.8 kPa d. 96.6 kPa
24. Which of the following contains the same number of atoms:
a. 12.0g C and 6.02×10^{23} atoms b. 16.0 g O_2 and 2.00 moles of oxygen
c. 1.00 mole carbon and 6.0g C d. 1.00 mole neon and 1.00 atom Ne
25. How many moles are in 93.9 g of carbon?
a. 1.56×10^{-22} b. 7.83 c. 1127 d. 5.65×10^{25}
26. Calculate the number of atoms of Zn in 3.0 moles.
a. 196.2 b. 0.0459 c. 1.81×10^{24} d. 4.98×10^{-24}
27. How many grams are in 5.08 moles of $\text{Ca}(\text{NO}_3)_2$?
a. 752.12 g b. 833.12 g c. 3.06×10^{24} g d. 0.03 g
28. In a chemical equation, the symbol used for a solution is
a. (g). b. (s). c. (aq). d. (sol).

For questions 29 – 30 use the solubility graph below.



29. According to the solubility graph, at 30°C, which of the following compounds is the most soluble in 100 grams of water?
- a. NaCl b. Yb₂(SO₄)₃ c. KNO₃ d. NaNO₃
30. According to the graph, 110 grams of KNO₃ dissolves at what temperature?
- a. 30°C b. 40°C c. 60°C d. 70°C
31. Which has the highest percentage of oxygen?
- a. NaHCO₃ b. (NH₄)₂SO₄ c. Na₂S₂O₃ d. H₂O₂
32. Arrange the following in order of increasing mass:
- w. 1 molecule of I₂
 x. 4.0 x 10²³ molecules of C₄H₁₀
 y. 6.02 x 10²³ molecules of CO
 z. 1 mole of P₂O₅
- a. w, y, x, z b. y, w, z, x c. z, x, y, w d. x, y, w, z
33. The concentration of a solution in moles of solute per liter of solution is called:
- a. molar mass b. molarity c. volume mass d. parts per million

34. The molarity of a solution in which 15.5g NaOH is dissolved in 0.100L of solution is _____?
a. 620 M b. 3.88 M c. 2.58 M d. 0.155 M
35. How many grams of ZnCl₂ are needed to make 25.0 mL of 0.105 M ZnCl₂ solution?
a. 0.24 g b. 0.36 g c. 2.6 g d. 4.2 g
36. What is the percent composition of sulfur by mass in this sample: 64 g S and 152 g Na?
a. 29.6% b. 42.1% c. 0.296% d. 70.3%
37. What is the percent composition of hydrogen by mass in C₃H₈?
a. 18.2 % b. 82% c. 50.0% d. 72.0%
38. Which of the following sets of coefficients are needed to balance the equation: ___Li + ___Br₂ ⇒ ___LiBr
a. 1,1,2 b. 2,0,2 c. 1,2,4 d. 2,1,2
39. Sodium tetraborate, Na₂B₄O₄, is produced according to the unbalanced equation:
$$\text{H}_3\text{BO}_3 + \text{NaOH} \Rightarrow \text{H}_2\text{O} + \text{Na}_2\text{B}_4\text{O}_7$$

How many grams of Boric acid, H₃BO₃, are needed to make 150,000 grams of Na₂B₄O₇?
a. 47.91 grams b. 5.39 x 10⁻³ c. 50096 grams d. 184157.36 grams
40. Magnesium can be reacted with Iodine to form magnesium iodide. How many grams of magnesium iodide can be formed from 8.06 grams magnesium and 63.46 grams iodine?
a. 75.5grams b. 8.16 grams c. 51.34 grams d. 102.68 grams

END OF TEST

Answer Key

1. A
2. A
3. B
4. B
5. C
6. D
7. B
8. D
9. A
10. B
11. D
12. D
13. D
14. C
15. B
16. A
17. D
18. A
19. C
20. C
21. A
22. C
23. D
24. A
25. B
26. C
27. B
28. C
29. D
30. C
31. D
32. C
33. B
34. B
35. B
36. A
37. A
38. D
39. D
40. C