Multiple Choice

1. The total number of atoms present in 0.554 mol of $[Fe(CO)_3(PH_3)_2]$ compound is:

D
A) 7.0×10^{25} B) 7.0×10^{24}
C) 6.0×10^{24} D) 5.0×10^{24}

2. The number of moles contained in 22.2 g of pyridine "C_5H_5N" is:

B
A) 0.32 B) 0.28 C) 0.25 D) 0.22

3. The mass (in gram) of 4.4×10^{22} molecule of table sugar "$C_{12}H_{22}O_{11}$" is:

C
A) 20.0 B) 22.0 C) 25.0 D) 27.0

4. The percentage by mass of platinum "Pt" in $[Pt(NH_3)_2Cl_2]$ is:

D
A) 74% B) 72% C) 69% D) 65%

5. The empirical formula of the compound that is 62.1% C, 10.4% H and 27.5% O by mass, is:

A
A) C_3H_6O B) C_5H_5O C) C_2H_5O D) C_2H_6O

6. Lithium "Li" metal and nitrogen "N_2" gas react to give lithium nitride "Li_3N" according to:

$6\ Li + N_2 \rightarrow 2\ Li_3N$

In a particular experiment 5.2 g of Li was allowed to react with excess N_2 and 7.4 g Li_3N were produced. The percentage yield of Li_3N is:

B
A) 80% B) 85% C) 87% D) 92%

7. An element combines with oxygen to form an oxide with the formula X_2O_5. If 30.6 g of this element combines with 24.0 g of oxygen, therefore the atomic mass of the element "in a.m.u." is:

D
A) 176 B) 142 C) 88 D) 51

8. Three separate aqueous solutions of lithium iodide "LiI", sodium iodide "NaI" and potassium iodide "KI", each solution contains 60.0 g of the solute in one liter of solution, therefore the molarity of:

B
A) the three solutions is the same.
B) LiI solution is the highest.
C) NaI solution is the highest.
D) KI solution is the highest.

9. The volume (in mL) of water that must be added to 100 mL of a stock solution of 6.0 M HNO_3 in order to prepare 0.8 M HNO_3 by dilution is:

C A) 750 B) 700 C) 650 D) 600

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10. The molality "m" of an aqueous solution that is 25% by mass phosphoric acid "H_3PO_4" is:

A A) 3.4 B) 3.1 C) 2.9 D) 2.7

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11. The standard temperature and pressure (STP) in the context of gases, refers to:

A) a temperature of zero degree Kelvin "**0.0 K**" and a pressure of **1.0 atm**.
B) a temperature of zero degree Celsius "**0.0°C**" and a pressure of **1.0 atm**.
B C) a temperature of **273°C** and a pressure of **1.0 atm**.
D) a temperature of **273°C** and a pressure of **0.0 atm**.

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12. A sample of a gas in a 3.0 L fixed volume closed container at a temperature of 27.0°C and a pressure of 620 torr. If the gas is heated to 147.0°C, the pressure of the gas (in torr) will be:

A A) 868 B) 914 C) 949 D) 1015

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13. The molar mass (in $g.mol^{-1}$) of a gas that 0.9848 g of it occupies 1.5 L at a temperature of 22.5°C and a pressure of 356 mmHg is:

B A) 44 B) 34 C) 32 D) 28

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14. At a temperature of 25°C and a pressure of 1.0 atm, the ratio of the speed of effusion of CO_2 gas to that of SO_2 gas is:

C A) 1.6 B) 1.4 C) 1.2 D) 1.1

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15. Zinc "Zn" reacts with aqueous sulfuric acid to give hydrogen "H_2" gas according to:

$$\mathbf{Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2}$$

In an experiment, 4.0 L of wet hydrogen is collected at a temperature of 27°C and a pressure of 748 torr. Knowing that the vapor pressure of water at 27°C is 26.74 torr, therefore, the mass (in g) of Zn that has been consumed is:

D A) 40 B) 30 C) 20 D) 10
