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Jordan University of Science & Technology
Department of Applied Chemical Sciences
CH 103- First
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Student's Name: **Instructor:**
Student's No.: **Section:** 12 **Serial No.:**

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B	C	B	D	D	B	D	D	C	C	E	C	B	E	A	A	B	E	A	B

Avogadro`s constant = 6.023×10^{23}

1 H 1.0																			2 He 4.0
3 Li 6.9	4 Be 9.0											5 B 10.8	6 C 12.0	7 N 14.0	8 O 16.0	9 F 19.0	10 Ne 20.2		
11 Na 23.0	12 Mg 24.3											13 Al 27.0	14 Si 28.1	15 P 31.0	16 S 32.0	17 Cl 35.5	18 Ar 40.0		
19 K 39.1	20 Ca 40.0	21 Sc 45	22 Ti 47.9	23 V 50.9	24 Cr 52.0	25 Mn 54.9	26 Fe 55.8	27 CO 58.9	28 Ni 58.7	29 Cu 63.5	30 Zn 65.4	31 Ga 69.7	32 Ge 72.6	33 As 74.9	34 Se 79.0	35 Br 79.9	36 Kr 83.8		

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check

1. When 1.0 mole of Cu_3FeS_3 and 10.0 mole of O_2 are mixed and allowed to react according to the equation: $2Cu_3FeS_3(s) + 7O_2(g) \rightarrow 6Cu(s) + 2FeO(s) + 6SO_2(g)$
   A. 6.5 mole of O_2 is in excess
   B. 3.5 mole of Cu_3FeS_3 is in excess.
   C. 0.93 mole of Cu_3FeS_3 is in excess.
   D. no reagent is in excess.
   E. 6.0 mole of Cu_3FeS_3 is in excess.

2. A common English set of units for expressing acceleration(التسارع) is miles/ $(hour)^2$. The **base SI** unit for acceleration is ------
   A. km/hr^2 B. km/s^2 C. m/s^2 D. m/hr E. cm/s

3. There should be _____ **significant figures** in the answer to the following computation.
   $(93. + 7.395) \div 2.500$
   A. 1 B. 2 100 ÷ 2.500 C. 3 D. 4 E. 5

If 4.73 g of Mg reacts with 3.94 g of H_2O according to: $Mg(s) + 2H_2O(l) \rightarrow Mg(OH)_2(s) + H_2(g)$
Answer questions **4, and 5:**

4. The **mass** in grams of hydrogen (H_2) expected to be produced is ---------.
   A. 0.102 B. 0.0162 C. 0.0485 D. 0.219 E. 0.204

5. If 0.092 g H_2 is produced from the above experiment, what is the **percentage yield**?
   A. 90 B. 5.7×10^2 C. 1.9×10^2 D. 42 E. 45

6. A sample of CHF_3 (M. M = 70 g/mol) with a mass of 19 g contains _____ **atoms of F.**
   A. 2.2×10^{23} B. 4.9×10^{23} C. 3.3×10^{24} D. 38 E. 9.5

7. Which of the following is (are) the **highest** temperature?
   A. The freezing point of water 0C B. 5 °C C. 25 °F
   D. 280 K 7C° E. A and D

Good Luck

8. A cube of an **unknown metal** measures 1.61 cm on one side. The mass of the cube is 25.5 g. Which of the following is most likely the **unknown metal**?

Metal	Rh	Cu	Nb	V	Zr
Density(g/cm^3)	12.4	8.96	8.63	6.11	6.51

A. Cu B. Rh C. Nb D. V E. Zr

9. Al reacts with a certain element to form a compound with the general formula AlX. What would the most likely formula be for the compound formed between potassium (K) and element X?
A. K_2X B. KX_2 C. K_3X D. K_3X_2 E. KX

10. Consider the reaction: $4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(s)$. How many **molecules of oxygen (O_2)** are required to react completely with 1600 atoms of iron(Fe)?
A. 600 B.1070 C.1200 D. 300 E. 535

11. The number of protons, neutrons and electrons in Ca^{2+} are --------, -------, and---------, respectively.
A. 20, 40, 20 B. 20, 20, 20 C.20, 20, 22 D. 20, 40, 18 E. 20, 20, 18

12. In an experiment a student measured the density of a piece of metal and got the data shown to the right. If the actual density of the metal is 5.00 g/mL, then the student is-------.
A. precise B. accurate
C. accurate and precise D. neither accurate nor precise

Trial	Density (g/mL)
1	5.00
2	4.99
3	5.01
4	5.02

13. 400 mL of **ethanol stock solution** was diluted to 4.00 L to prepare 0.0200 M of ethanol solution, the concentration of the **stock solution** was _____ M.
A. 0.400 B. 0.200 C. 2.00 D. 1.60 E. 4.00

14. How many mL of a 0.827 M KOH solution are required to neutralize 35.0 mL of 0.464 M H_2SO_4?
A. 35.0 B. 1.12 C. 25.8 D. 62.4 E. 39.3

15. How many mL of H_2O should be added to 10.0 grams of acetic acid (d = 1.3 g/mL) in order to prepare 2.0 M solution of acetic acid?(M. M of acetic acid = 60 g/mol)
A. 76 mL B. 83 mL C. 45 mL D. 50 mL E. 1000 mL

16. Which of the following would have to gain **one electron** in order to achieve a noble gas electron configuration? O Mg Na Se Br
A. Br B. Mg C. Na D. O, Se E. Mg, O, Se

17. The point in a titration at which the indicator color changes is called the _____.
A. setpoint B. endpoint C. standard point
D. indicator point E. equivalent point

18. Acceleration due to gravity of a free-falling object is 9.8 m/s^2. Express this in nm/ms^2 (nanometers/millisecond^2).
A. 9.8×10^{-9} B. 9.8×10^{3} C. 9.8×10^{-6} D. 9.8×10^{6} E. 9.8×10^{-3}

19. The **molar mass** of $Ca(ClO_4)_2.6H_2O$ is ------.
A. 347 g/mol B. 267 g/mol C. 178 g/mol D. 232 g/mol E. 248 g/mol

20. Consider the reaction: $Co(NH_3)_xCl_3(aq) + xHCl(aq) \rightarrow xNH_4^+(aq) + Co^{3+}(aq) + (x+3)Cl^-(aq)$
Assume you use 21.03 mL of 1.500 M HCl to react completely with 1.580 g of $Co(NH_3)_xCl_3$. What is **the value of x?**
A. 2 B. 3 C. 4 D. 6 E. 5

Good Luck