JORDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY
Department of Applied Chemical Sciences
CH 103 First Exam

Name: _____ **Section # :** 12

Serial #: _____ **Instructor's Name:** Dr Li

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	B	B	B	D	D	E	D	A	E	B	D	C	B	B	A	D	C	C	D

Avogadro's Number = 6.022×10^{23}

1 H 1.00																			2 He 4.00
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 32.1	17 Cl 35.5	18 Ar 39.9		
19 K 39.1	20 Ca 40.0	21 Sc 45.0	22 Ti 47.9	23 V 50.9	24 Cr 51.0	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		
37 Rb 85.5	38 Sr 87.6	39 Y 88.9	40 Zr 91.2	41 Nb 92.9	42 Mo 95.9	43 Tc 98.0	44 Ru 101	45 Rh 102	46 Pd 106	47 Ag 107	48 Cd 112	49 In 114	50 Sn 118	51 Sb 121	52 Te 127	53 I 126	54 Xe 131		

1. 1.0 nanometer = _____ picometers.
   A) 1000 B) 0.1 C) 0.01 D) 1 E) 10

2. The number 0.00430 has _____ significant figures.
   A) 2 B) 3 C) 5 D) 6 E) 4

3. How many significant figures should be in the answer to the following computation?
   $(29.2 - 20.0)(1.79 \times 105)/1.39$
   A) 1 B) 2 C) 3 D) 4 E) 5

4. The density of mercury is $13.6\ g/cm^3$. The density of mercury in **SI units** is _____.
   A) 1.36×10^{-2} B) 1.36×10^{4} C) 1.36×10^{8} D) 1.36×10^{-5} E) 1.36×10^{-4}

5. Elements in Group **7A** are known as the _____.
   A) chalcogens B) alkali metals C) alkaline earth metals
   D) halogens E) noble gases

6. The formula of a salt is XCl_2. The X-ion in this salt has 36 electrons. The metal X is _____.
   A) Zr B) Kr C) O D) Sr E) K

7. The ions Ca^{2+} and PO_4^{3-} form a salt with the formula _____.
A) $CaPO_4$ B) $Ca_2(PO_4)_2$ C) $Ca_3(PO_4)_3$ D) $Ca(PO_4)_2$ E) $Ca_3(PO_4)_2$

8. An element in the **upper right corner** of the periodic table _____.
A) a metal or metalloid B) a metal C) a metalloid
D) a non-metal E) a metalloid or a non-metal

9. How many grams of hydrogen are in 46 g of CH_4O (MM=32 g/mo)?
A) 5.8 B) 1.5 C) 2.8 D) 0.36 E) 184

10. According to the following reaction: $2S(s) + 3O_2(g) \rightarrow 2SO_3(g)$. If 0.80 g of SO_3 were produced actually from the reaction of 1.0 g S with 1.0 g O_2, What is the percentage yield of SO_3?
A) 30 B) 29 C) 21 D) 88 E) 48

11. What is the number of moles of $C_6H_{12}O_6$ (MM = 180g/mol) in a 30.5 gram sample of $C_6H_{12}O_6$?
A) 0.424 B) 0.169 C) 5.90 D) 2.36 E) 0.136

12. How many oxygen atoms are contained in 2.74 g of $Al_2(SO_4)_3$ (MM = 342.1 g/mol)?
A) 12 B) 6.02×10^{23} C) 7.22×10^{24} D) 5.79×10^{22} E) 8.01×10^{-3}

13. The molarity of an aqueous solution containing 22.5 g of $C_{12}H_{22}O_{11}$ in 35.5 mL of solution is:
A) 0.0657 B) 1.85×10^{-3} C) 1.85 D) 3.52 E) 0.104

14. What volume of a concentrated solution of 6.00 M NaOH must be diluted to 200 mL to make a 1.50 M solution of NaOH?
A) 0.0500 mL B) 50.0 mL C) 45.0 mL D) 800 mL E) 0.800 mL

15. Consider the reaction $AgNO_3 + HBr \rightarrow AgBr + NaNO_3$. What mass of AgBr (MM = 187.8 g/mol) is formed when 35.5 mL of 0.184 M $AgNO_3$ is treated with an excess of aqueous HBr solution?
A) 1.44 g B) 1.23 g C) 53.6 g D) 34.5 g E) 188 g

16. What volume of 0.135 M NaOH required to completely react (neutralize) with 13.7 mL of 0.129 M HCl?
A) 13.1 mL B) 0.24 mL C) 14.3 mL D) 0.076 mL E) 6.55 mL

17. Which of the following would have to **gain** two electrons in order to achieve a noble gas electron configuration? **O Sr Na Se Br**
A) Br B) Sr C) Na D) O, Se E) Sr, O, Se

18. The chloride salt of which of the following metals should have the **greatest** lattice energy?
A) K B) Rb C) Al D) Ca E) Mg

19. Which of the following has the **smallest** size?
A) Li B) Na^+ C) Li^+ D) Rb E) Rb^+

20. The Lewis dot symbol for the calcium ion is

A) $:Ca:^{2+}$ B) —Ca— C) $:\ddot{Ca}:^{2+}$ D) Ca^{2+} E) **Ca**