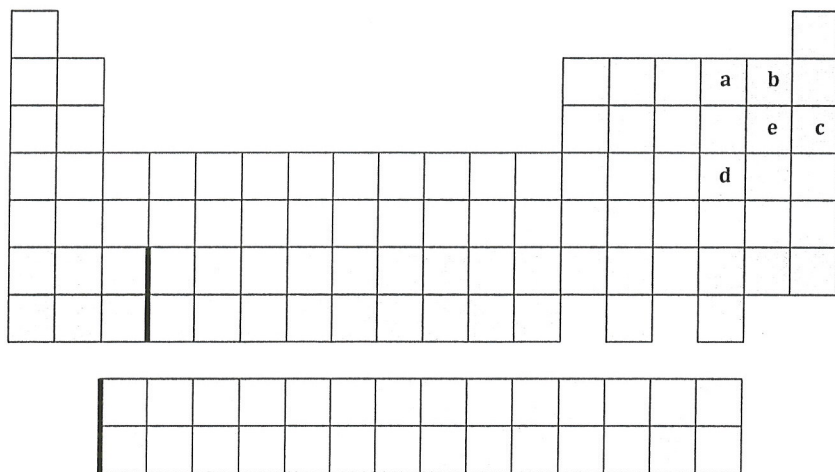
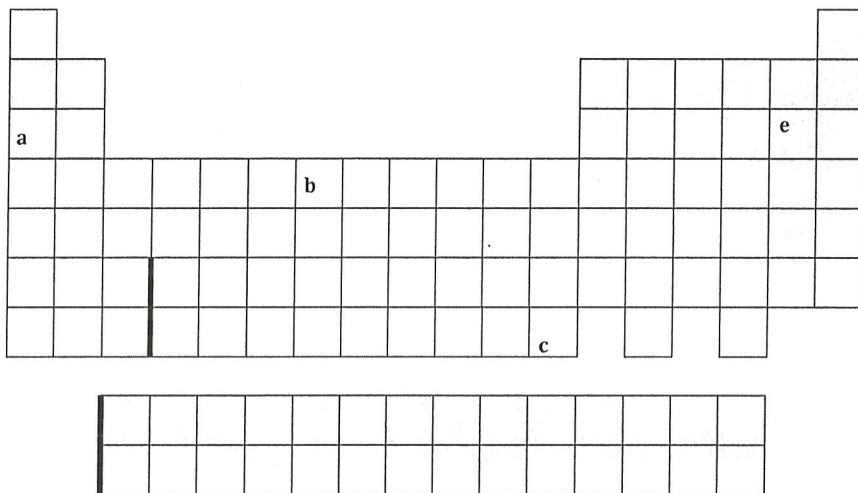


3) Which element is most chemically similar to the element indicated by the letter E in the following periodic table?



B

4) Which element indicated by the letter in the following periodic table reacts rapidly with water to form an alkaline solution?



a

5) You are visiting the planet Lagmom. The money exchange rates are shown below. How many Lagmom fizzbarts will you receive in exchange for \$500 at the Lagmom Spaceport Currency Exchange counter?

\$1.00 = 10 razz

5 pobs = 1 fizzbart

1 tanta = 2 morbs

1 morb = 25 pobs

5 razz = 1 tanta

$$\$500 \times \frac{10 \text{ razz}}{\$1.00} \times \frac{1 \text{ tanta}}{5 \text{ razz}} \times \frac{2 \text{ morbs}}{1 \text{ tanta}} \times \frac{25 \text{ pobs}}{1 \text{ morb}}$$

$$\times \frac{1 \text{ fizzbart}}{5 \text{ pobs}} = 10,000$$

fizzbart

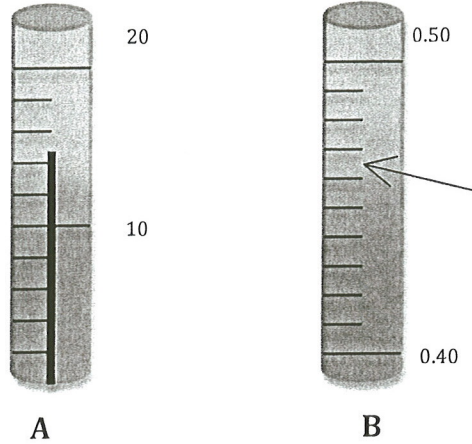
$$\frac{12}{12}$$

2

6) Evaluate the cylinders

- a) Which cylinder will provide the most precise measured value? B
- b) Using the correct number of significant figures, what is the reading of cylinder A? 14-15
- c) Using the correct number of significant figures, what is the reading of cylinder B? 0.465

0.44 —



7) Which of the following atoms must exist as a diatomic molecule?

- a) Pb
- b) P
- c) C
- d) O

→ O₂

8) Draw a line to the value that best describes the prefix.

Micro-	_____	10 ⁻³
Giga-	_____	.01
Centi-	_____	0.000001
Kilo-	_____	1,000,000,000
Milli-	_____	1000

9) True/False

An exact number has a degree of uncertainty. F

10/10

3

10) Convert 15 m^3 to liters

a) $1.5 \times 10^{-2} \text{ L}$

b) 1.5 L

c) $1.5 \times 10^2 \text{ L}$

d) $1.5 \times 10^4 \text{ L}$

$$15 \text{ m}^3 \rightarrow 1.5 \times 10^3 \text{ L}$$

(2)

11) A gold ingot weighs 5.50 lbs. If the density of gold is 19.31 g/cm^3 , and the length and width of the ingot are 12.0 cm and 3.00 cm respectively, what is the height of the ingot? ($453.6 \text{ g} = 1.00 \text{ lb}$)

$$5.50 \text{ lbs} \times \frac{453.6 \text{ g}}{1.00 \text{ lbs}} \times \frac{1 \text{ cm}^3}{19.31 \text{ g}} = 129.1973 \text{ cm}^3$$

(6)

$$129.1973 \text{ cm}^3 = L \times w \times H \\ = (12.0 \text{ cm})(3.00 \text{ cm}) \times H$$

$$\frac{129.1973 \text{ cm}^3}{(12.0 \text{ cm})(3.00 \text{ cm})} = H \rightarrow 3.5888 \text{ cm} \\ \rightarrow 3.59 \text{ cm}$$

12) How many significant figures are in each of the following measure numbers?

a) 0.032

2

b) 1.1101

5

(2)

c) 50.0

3

d) 766010

5

(2)

13) Write the following in scientific notation (the underlined digit represents the significant figure cut off):

a) 0.003002

$$\underline{3.002} \times 10^{-3}$$

b) 94560.0234

$$\underline{9.45} \times 10^4$$

(2)

14) True/False

An isotope is an atom that has the same number of protons and neutrons, but a different number of electrons.

F (1)

$\frac{15}{15}$ 4

15) A student does experiment #4 (salt/sand) just like you. Using the student's data below, calculate the percent of salt in her sample.

Weight of evaporating dish: 42.09 g

Weight of evaporating dish and sample: 51.46 g

Weight of evaporating dish and sand after drying: 47.86 g

10

$$51.46\text{g} - 42.09\text{g} = 9.37\text{g}$$

$$47.86\text{g} - 42.09\text{g} = 5.77\text{g}$$

$$\frac{(9.37\text{g}) - (5.77\text{g})}{9.37\text{g}} \times 100 = 38.42\%$$

or \rightarrow 38.4% salt

16) Identify the chemical symbol of element X in ${}_{34}^{80}\text{X}$ Se 1

17) Boron-9 can be represented as

a) ${}^9_5\text{Be}$

b) ${}^9_5\text{B}$ 1

c) ${}^{14}_5\text{B}$

d) ${}^{14}_9\text{B}$

18) How many protons (p), neutrons (n), and electrons (e) are in one atom of ${}^{23}_{12}\text{Mg}$

1 p = 12 n = 11 e = 12

19) Provide the electron configuration or the element, where applicable, for the following. Do not use a Noble gas core for this question:

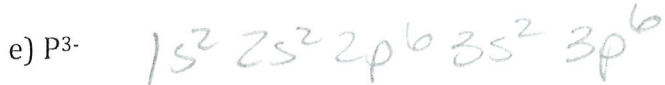
3 a) Pb^{2+} $1s^2 2s^2 2p^6 3s^2 3p^4 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10}$

3 b) S $1s^2 2s^2 2p^6 3s^2 3p^4$

3 c) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$ Sc

3 d) $[\text{He}] 2s^2 2p^3$ N

$\frac{25}{25}$ 5



(3)

20) What noble-gas element has the same number of electrons as each of the following ions?



21) In lab #14, which anion(s) formed precipitates when silver nitrate solution was added?



22) How many total electrons can be found in a shell 3 ($n = 3$)?



23) How many electrons can be placed in one orbital?



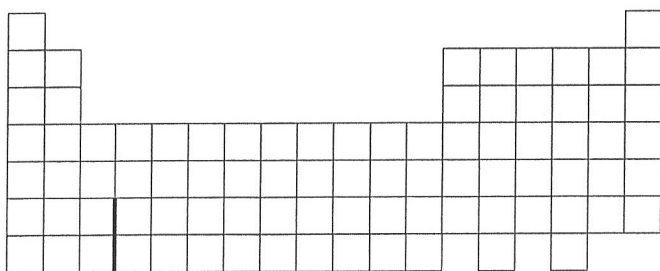
24) True/False

Orbitals do not exist as three-dimensional structures. F

25) What are three common characteristics of the valence shell.

$8e^{-}$, outer most shell, highest in energy

26) Using the periodic table below, shade in the f orbital region.



f



6

27) What is the symbol for an atom having 15 protons and 18 electrons? (1)



28) How many electrons are in $^{45}\text{Sc}^{3+}$ (2)



29) The nucleus of F-19 contains... (2)

$$n = 10 \quad p = 9$$

30) A hypothetical element, Hy, has three isotopes, Hy-299, Hy-300, and Hy-301, which have the following natural abundance: 5.00% (Hy-299), 65.00% (Hy-300), and 30.00% (Hy-301). The atomic masses of the isotopes are 299.0 amu, 300.0 amu, and 301.0 amu, respectively. Calculate the atomic mass of Hy. (10)

$$\begin{array}{r} (0.05)(299.0 \text{ amu}) = 14.9500 \text{ amu} \\ (0.65)(300.0 \text{ amu}) = 195.0000 \text{ amu} \\ (0.30)(301.0 \text{ amu}) = 90.3000 \text{ amu} \\ \hline 300.2500 \text{ amu} \\ \rightarrow 300.3 \text{ amu} \end{array}$$

31) How many minutes will it take to drive to Los Angeles from San Francisco if an average speed of 72 mi/hr is maintained? The distance between the two cities is 405 miles. (5)

$$\begin{array}{r} 405 \text{ miles} \times \frac{1 \text{ hr}}{72 \text{ mile}} \times \frac{60 \text{ min}}{1 \text{ hr}} \\ = 337.500 \text{ min} \\ \rightarrow 338 \text{ min} \end{array}$$

32) What is the name of this class? (5)

Chemistry 22

$$\frac{13}{13} \frac{25}{25} = 7$$

Name _____

1
2
3
4
5
6

IA	IIA	IIIB	IVB	VB	VIB	VII B	VIII						IB	IIB	IIIA	IVA	VA	VIA	VIIA	VIIIA
1.008 H 1																				4.003 He 2
6.941 Li 3	9.012 Be 4													10.811 B 5	12.011 C 6	14.007 N 7	15.999 O 8	18.998 F 9	20.179 Ne 10	
22.990 Na 11	24.305 Mg 12													26.982 Al 13	28.0855 Si 14	30.9738 P 15	32.06 S 16	35.453 Cl 17	39.948 Ar 18	
39.0983 K 19	40.08 Ca 20	44.956 Sc 21	47.90 Ti 22	50.9415 V 23	51.996 Cr 24	54.938 Mn 25	55.847 Fe 26	58.933 Co 27	58.71 Ni 28	63.546 Cu 29	65.37 Zn 30	69.72 Ga 31	72.59 Ge 32	74.922 As 33	78.96 Se 34	79.904 Br 35	83.80 Kr 36			
85.468 Rb 37	87.62 Sr 38	88.906 Y 39	91.22 Zr 40	92.9064 Nb 41	95.94 Mo 42	98.906 Tc 43	101.07 Ru 44	102.906 Rh 45	106.4 Pd 46	107.868 Ag 47	112.41 Cd 48	114.82 In 49	118.69 Sn 50	121.75 Sb 51	127.60 Te 52	126.904 I 53	131.30 Xe 54			
132.906 Cs 55	137.33 Ba 56	138.906 *La 57	178.49 Hf 72	180.948 Ta 73	183.85 W 74	186.2 Re 75	190.2 Os 76	192.22 Ir 77	195.09 Pt 78	196.967 Au 79	200.59 Hg 80	204.37 Tl 81	207.2 Pb 82	208.981 Bi 83	(209) Po 84	(210) At 85	(222) Rn 86			
(223) Fr 87	226.025 Ra 88	(227) **Ac 89	(261) Rf 104	(262) Ha 105	(263) Sg 106	(262) Ns 107	(265) Hs 108	(266) Mt 109	(269) — 110	(272) — 111										

*Lanthanide series

140.12 Ce 58	140.908 Pr 59	144.24 Nd 60	(145) Pm 61	150.4 Sm 62	151.96 Eu 63	157.25 Gd 64	158.925 Tb 65	162.50 Dy 66	164.930 Ho 67	167.26 Er 68	168.934 Tm 69	173.04 Yb 70	174.967 Lu 71
232.038 Th 90	231.031 Pa 91	238.029 U 92	237.048 Np 93	(244) Pu 94	(243) Am 95	(247) Cm 96	(247) Bk 97	(251) Cf 98	(254) Es 99	(257) Fm 100	(256) Md 101	(255) No 102	(257) Lr 103

**Actinide series