

1) The freezing point of water at 1 atm pressure is \_\_\_\_\_.

- A) 0°F
- B) 0 K
- C) 0°C
- D) -273°C
- E) -32°F

2) The number 0.00430 has \_\_\_\_\_ significant figures.

- A) 2
- B) 3
- C) 5
- D) 6
- E) 4

3) \_\_\_\_\_ significant figures should be retained in the result of the following calculation.

$$(1.0 + 3.01) / 5.00$$

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

4) In the following list, only \_\_\_\_\_ is not an example of a chemical reaction.

- A) dissolution of a penny in nitric acid
- B) the condensation of water vapor
- C) a burning candle
- D) the formation of polyethylene from ethylene
- E) the rusting of iron

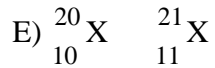
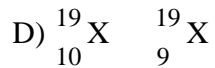
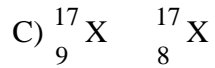
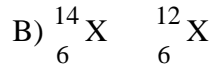
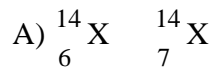
5) What is the volume (in cm<sup>3</sup>) of a 4.0 g piece of metal with a density of 12.00 g/cm<sup>3</sup>?

- A) 48.00
- B) 48.0
- C) 0.33
- D) 3.0
- E) none of the above

6) \_\_\_\_\_ and \_\_\_\_\_ reside in the atomic nucleus.

- A) Protons, electrons
- B) Electrons, neutrons
- C) Protons, neutrons
- D) none of the above
- E) Only neutrons

7) Which pair of atoms constitutes a pair of isotopes of the same element whose symbol is 'X'?



8) \_\_\_\_\_ are found uncombined, as monatomic species in nature.

A) Noble gases

B) Chalcogens

C) Alkali metals

D) Alkaline earth metals

E) Halogens

9) Sodium forms an ion with a charge of \_\_\_\_\_.

A) +1

B) -1

C) +2

D) -2

E) 0

10) Predict the empirical formula of the ionic compound that forms from magnesium and fluorine.

A)  $\text{Mg}_2\text{F}_3$

B)  $\text{MgF}$

C)  $\text{Mg}_2\text{F}$

D)  $\text{MgF}_2$

E)  $\text{F}_3\text{Mg}_2$

11) The correct name for  $\text{CCl}_4$  is \_\_\_\_\_.

A) carbon chloride

B) carbon tetrachlorate

C) carbon perchlorate

D) carbon tetrachloride

E) carbon chlorate

12) The formula of the carbonate ion is \_\_\_\_\_.

- A)  $\text{CO}_2^{2-}$
- B)  $\text{CO}_3^{2-}$
- C)  $\text{CO}_3^{3-}$
- D)  $\text{CO}_2^-$
- E)  $\text{CO}^-$

13) \_\_\_\_\_-rays consist of fast-moving electrons.

- A) alpha
- B) beta
- C) gamma
- D) X
- E) none of the above

14) Of the three types of radioactivity characterized by Rutherford, which is/are electrically charged?

- A)  $\beta$ -rays
- B)  $\alpha$ -rays and  $\beta$ -rays
- C)  $\alpha$ -rays,  $\beta$ -rays, and  $\gamma$ -rays
- D)  $\alpha$ -rays
- E)  $\alpha$ -rays and  $\gamma$ -rays

15) Of the following, the smallest and lightest subatomic particle is the \_\_\_\_\_.

- A) neutron
- B) proton
- C) electron
- D) nucleus
- E) alpha particle

16) Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- A) H, Li
- B) Cs, Ba
- C) Ca, Sr
- D) Ga, Ge
- E) C, O

17) Which one of the following compounds is copper(I) chloride?

- A)  $\text{CuCl}$
- B)  $\text{CuCl}_3$
- C)  $\text{Cu}_2\text{Cl}$
- D)  $\text{CuCl}_2$
- E)  $\text{Cu}_2\text{Cl}_2$

18) There are \_\_\_\_\_ molecules of methane in 0.1 mol of methane (CH<sub>4</sub>).

- A) 0.1
- B)  $6.02 \times 10^{23}$
- C) 1/4
- D)  $6.02 \times 10^{22}$
- E)  $6.02 \times 10^{25}$

19) The combustion of propane C<sub>3</sub>H<sub>8</sub> in the presence of excess oxygen yields CO<sub>2</sub> and H<sub>2</sub>O:



When 2.5 mol of O<sub>2</sub> are consumed in their reaction, \_\_\_\_\_ mol of CO<sub>2</sub> are produced.

- A) 1.5
- B) 3.0
- C) 5.0
- D) 6.0
- E) 2.5

20) If the atomic mass of C = 12 g/mol and H = 1 g/mol, then the mass % of C in methane (CH<sub>4</sub>) is \_\_\_\_\_.

- A) 25.13
- B) 133.6
- C) 74.87
- D) 92.26
- E) 7.743

21)  $3 \times 10^3$  squared is:

- A)  $9 \times 10^3$
- B)  $9 \times 10^6$
- C)  $3 \times 10^6$
- D)  $3 \times 20^3$
- E)  $9 \times 10^9$

22)  $9x + 3y = 7$ , solve for x:

- A)  $x = 7 - (3y/9)$
- B)  $x = (7 - 3y)/9$
- C)  $x = (9 - 7y)/3$
- D)  $x = 9 * (7 - 3y)$
- E)  $x = 3 * (9 - 7y)$

23) Rank these six numbers from lowest to highest:  $1/3$ ,  $0.27$ ,  $3 \times 10^{-3}$ ,  $5$ ,  $2.14$ ,  $4 \times 10^4$

- A)  $3 \times 10^{-3}$ ,  $1/3$ ,  $0.27$ ,  $2.14$ ,  $4 \times 10^4$ ,  $5$
- B)  $1/3$ ,  $0.27$ ,  $3 \times 10^{-3}$ ,  $2.14$ ,  $5$ ,  $4 \times 10^4$
- C)  $3 \times 10^{-3}$ ,  $1/3$ ,  $0.27$ ,  $2.14$ ,  $5$ ,  $4 \times 10^4$
- D)  $3 \times 10^{-3}$ ,  $0.27$ ,  $1/3$ ,  $2.14$ ,  $5$ ,  $4 \times 10^4$
- E)  $0.27$ ,  $1/3$ ,  $5$ ,  $2.14$ ,  $3 \times 10^{-3}$ ,  $4 \times 10^4$

	1A 1																			8A 18	
1	1 H	2A 2										3A 13	4A 14	5A 15	6A 16	7A 17	2 He				
2	3 Li	4 Be										5 B	6 C	7 N	8 O	9 F	10 Ne				
3	11 Na	12 Mg	3B 3	4B 4	5B 5	6B 6	7B 7	8B 8 9 10			1B 11	2B 12	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar			
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr			
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe			
6	55 Cs	56 Ba	71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn			
7	87 Fr	88 Ra	103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110	111	112	113	114	115	116					

	Metals	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb
	Metalloids	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No
	Nonmetals														