Directions: For each question, choose the answer you consider to be the best and indicate your choice on the scantron sheet provided. (1 point each)

1. How many molecules are there in 180 g of H_2O?

A. 6.0×10^{22}
B. 6.0×10^{23}
C. 6.0×10^{24}
D. 6.0×10^{25}

2. Which sample contains the smallest amount of oxygen?

A. 0.3 mol H_2SO_4
B. 0.6 mol O_3
C. 0.7 mol HCOOH
D. 0.8 mol H_2O

3. Which of the following compounds has the greatest **empirical** formula mass?

A. C_6H_6
B. C_4H_{10}
C. C_3H_6
D. C_2H_6

4. The number of moles in 500 g of water is approximately:

A. 28
B. 9000
C. $1x10^{25}$
D. $3x10^{26}$

5. What is the empirical formula of a compound containing 85.7 % by mass of carbon and 14.3 % by mass of hydrogen?

A. CH
B. CH_2
C. CH_4
D. C_2H_5

6. When the equation $C_4H_{10} + O_2 \rightarrow CO_2 + H_2O$ is balanced correctly, what is the coefficient for O_2?

A. 9
B. 13
C. 18
D. 24

7. The decomposition of $KClO_3$ occurs according to the balanced equation below. How many moles of KCl would be produced along with 6.30 mol of oxygen?

$$2KClO_3 \rightarrow 2KCl + 3O_2$$

A. 4.20
B. 6.30
C. 12.6
D. 18.9

8. Which one of the following statements is incorrect?

A. All fluorine atoms contain 9 protons
B. All chlorine atoms have a mass of 35.45 amu
C. A mole of carbon contains 6.02×10^{23} atoms
D. A 20.0 g sample of zinc contains 1.84×10^{23} atoms

9. Which of the following particles contain more electrons than neutrons?

I. $^{1}_{1}H$
II. $^{35}_{17}Cl^{-}$
III. $^{39}_{19}K^{+}$

A. I only
B. II only
C. I and II only
D. II and III only

10. Isotopes of an element have the same number of

A. protons and electrons.
B. protons and neutrons.
C. neutrons and electrons.
D. protons, neutrons and electrons.

11. Copper consists of isotopes ^{63}Cu and ^{65}Cu and has a relative atomic mass of 63.55. What is the most likely composition?

	^{63}Cu	^{65}Cu
A.	30%	70%
B.	50%	50%
C.	55%	45%
D.	70%	30%

12. What information about the structure of a hydrogen atom can be gained from its emission spectrum?

A. Most of the mass of the atom is in its nucleus.
B. A hydrogen atom contains one proton and one electron.
C. The electron in the hydrogen atom is held near the nucleus.
D. The electron may exist in any of several energy levels.

13. Which species have electronic configurations 2.8.8, 2.8 and 2.8.1 respectively?

A. Ne, F, Na
B. K^+, F^-, Mg^{2+}
C. Ca^{2+}, F, Na^+
D. Cl^-, F^-, Na

14. Elements in the same group of the Periodic Table have the same

A. number of protons.
B. ionisation energy.
C. reactivity.
D. number of outer electrons.

15. An element is in group 3 and period 2. How many electrons are present in its outer shell?

A. 2
B. 3
C. 5
D. 6

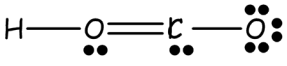
16. A Group 1 element, *X*, bonds with a Group 7 element, *Y*. What is the most likely formula and type of bonding in this compound?

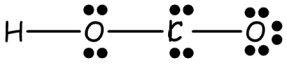
A. X_2Y ionic
B. XY ionic
C. XY covalent
D. XY_2 covalent

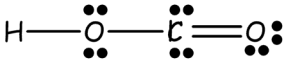
17. Which compound has the greatest ionic character?

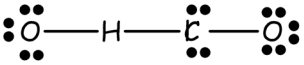
A. MgS
B. HCl
C. CO_2
D. CaO

18. Which one of the following is the correct Lewis electron dot structure of $HClO_2$?

A. 

B. 

C. 

D. 

19. When the Lewis structure for $HCOOCH_3$ is drawn, how many bonding and how many lone pairs of electrons are present?

	Bond pairs	**Lone pairs**
A.	8	4
B.	7	5
C.	7	4
D.	5	5

20. In which of the following is there at least one double bond?

I. O_2
II. CO_2
III. C_2H_4

A. I only
B. III only
C. II and III only
D. I, II and III