2022 Senior 1 Revision Exercise Paper 1

1. Dissolving 2g of brass in excess hydrochloric acid can result in 2.2g of zinc chloride. What is the percentage of zinc in the alloy?

A. 47.4% B. 52.7% C. 60.5% D. 90%

2. The molecular formula of the gas element X is X_4. How many molecules are there in 60g of element X if the relative atomic mass is 30?

A. 1×10^{23} B. 2×10^{23} C. 3×10^{23} D. 4×10^{23}

3. The nucleus of element X contains N neutrons. X^{2+} is an ion of X, electron configuration of X^{2+} is $1s^2 2s^2 2p^6$. What is the atomic number of element X?

A. 8 B. 10 C. 12 D. n - 10

4. Which of the following is **wrong** about ammonia molecule and water molecule?

A. Both are polar
B. Both have dative bond
C. Both have lone pair electrons
D. Both can form hydrogen bond between the molecules

5. Which of the following substances contains dative bond?

i. Diamine silver(I) chloride
ii. Hydrogen ion
iii. Aluminium chloride powder
iv. Aluminium chloride

A. I, II, III B. I, II, IV C. I, III, IV D. II, III, IV

6. $5NH_4NO_3$ (s) ----------> $2HNO_3$ (AQ) + $4N_2$ (G) + $9H_2O$ (l)

What is/are the product(s) of the oxidation and reduction in this reaction?

A. N_2 (g)
B. HNO_3 (aq)
C. N_2 (g) and HNO_3 (aq)
D. N_2 (g) and H_2O (l

7. 2.2g of carbon dioxide contains _____.

A. 3.0×10^{22} atoms
B. 0.5 mol CO_2 molecules
C. the same number of molecules as the one in 2.2g of propane (C_3H_8)
D. Molecules that is half of the hydrogen atoms in 2.24L of hydrogen gas under STP

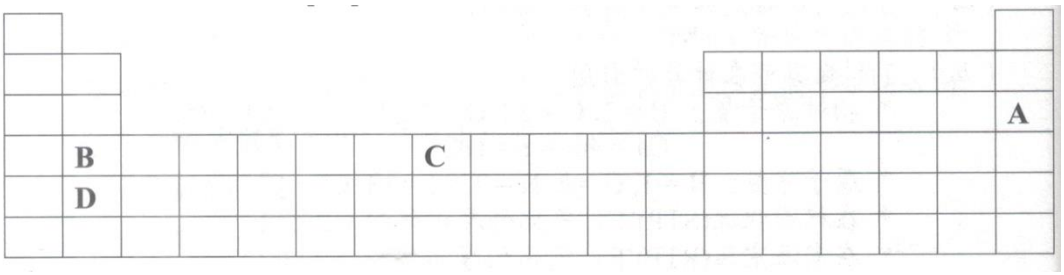
8. Metal X forms 2 chlorides A and B. A, B each occupies 38.17% and 48.80% of chlorine. If the molecular formula of A is XCl_2, the molecular formula of B is _____.

A. X_2Cl B. XCl C. XCl_3 D. X_2Cl_5

9. Which of the followings is the correct electron configuration for Al^{3+} ion?

A. $1s^2\ 2s^2\ 2p^4$
B. $1s^2\ 2s^2\ 2p^6$
C. $1s^2\ 2s^2\ 2p^6\ 3s^2$
D. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

10. Electron configuration of an element is [Ar] $3d^6\ 4s^2$. What is the most possible position of this element in the periodic table of elements?



11. Which chemical bond do the molecules of solid ammonium chloride contains?

i. Hydrogen bond ii. Covalent bond iii. Ionic bond iv. Coordinate bond

A. I, II, III B. I, II, IV C. I, III, IV D. II, III, IV

12. In different scenarios, hydrogen peroxide can be oxidant or reductant. Which of the following chemical equations shows that hydrogen peroxide is a reductant?

A. $PbX + 4H_2O_2 \text{ ----> } PbSO_4 + 4H_2O$
B. $PbO_2 + H_2O_2 \text{ ----> } PbO + H_2O + O_2$
C. $2Fe^{2+} + H_2O_2 + 2H^+ \text{ ----> } Fe^{3+} + 2H_2O$
D. $2KI + H_2SO_4 + H_2O_2 \text{ ----> } K_2SO_4 + I_2 + 2H_2O$

13. 1.2 mol of element M reacts with 1.5 mol of oxygen when heating. Which of the following is the simplest chemical formula of M oxide?

A. M_4O_5
B. M_3O_2
C. M_2O_5
D. M_2O_3

14. Below are some properties of chemical compound P and Q:

1. Have hydrogen bond
2. Can form covalent compound
3. Compound Q has a higher boiling point that compound P

What are chemical compound P and Q?

	P	Q
A.	CH_3CH_2OH	CH_3COOH
B.	H_2O	NH_3
C.	HBr	HCl
D.	PH_3	NH_3

15. Which of the following reactions shows that sulphur dioxide as a reducing agent?

A. $SO_2 + 2Mg$ ----> $MgO + S$
B. $So_2 + NaOH$ ----> $NaHSO_3$
C. $2H_2S + SO_2$ ----> $2S + 2H_2O$
D. $2H_2O + SO_2 + Fe_2(SO_4)_3$ ----> $2FeSO_4 + 2H_2SO_4$

16. The atomic ratio of element X, Y is 7 : 2. When they combine to form a chemical compound, percentage of element X in the compound is 70%, thus what is the chemical formula of this compound?

A. XY B. X_2Y_3 C. X_3Y_2 D. X_3Y_4

17. 10g of certain mineral sample contains 2.8g of HgS, what is the percentage of mercury in this mineral?

A. 4% B. 24% C. 28% D. 56%

18. Element X and Y can form ionic compound X_2Y_3. Which of the following is most probably the electron arrangement in the outermost electron shell of X and Y?

	P	Q
A.	$2s^22p^2$	$2s^22p^4$
B.	$3s^2$	$2s^22p^3$
C.	$3s^23p^1$	$3s^23p^5$
D.	$3s^23p^1$	$3s^23p^4$

19. Calculate the mass of 3.01×10^{23} oxygen molecules

A. 4g B. 8g C. 16g D. 32g

20. 15.5g element X and 20g of oxygen combine to form a oxide. If the relative atomic mass of element X is 31, which of the followings is the empirical formula of the oxide?

A. XO B. X_2O_3 C. X_2O_5 D. X_2O_7

21. Strontium-90 (atomic number = 38) is used in radioactive therapy. Which of the followings regarding Strontium-90's atomic structure is **correct**?

A. Strontium-90 has 38 electrons
B. Strontium-90 has 90 neutrons
C. Strontium-90 has 40 neutrons
D. Strontium-90 has 52 protons

22. Which chemical compound cannot form hydrogen bond between molecules?

A. CH_3CHO B. CH_3OH C. NH_3 D. HF

23. Calculate the oxidation number of phosphorus in PO_4^{3-}.

A. -5 B. -4 C. +5 D. +4

24. Which of the followings is correct?

i. Ionic compound may have covalent bond.
ii. It is certain that covalent compound does not have ionic bond.
iii. Covalent bond found in a diatomic molecule must be a non-polar bond.

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

25. Which of the following solid atoms or molecules contain Van der Waals?

A. H_2O (s) B. CO_2 (s) C. MgO (s) D. SiO_2 (s)