1. A fruit drink coloured orange contains a dissolved mixture of red and yellow colouring agents. One of these colouring agents is suspected of being illegal.

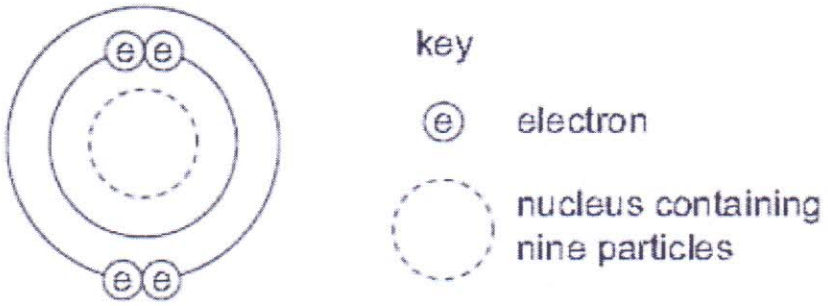
   Which method could be used to show the presence of this illegal colouring agent?

   A. chromatography
   B. distillation
   C. evaporation
   D. filtration

2. A student carries out an experiment to find how fast 3 cm pieces of magnesium ribbon dissolve in 10 cm^3 samples of sulfuric acid at different temperatures.
   Which piece of apparatus does the student not need?

   A. balance
   B. measuring cylinder
   C. stop-clock
   D. thermometer

3. The diagram shows an atom



   What is the proton number and neutron number of the atom?

	Proton Number	Neutron number
A	4	5
B	4	9
C	5	4
D	5	9

4. The symbols of two atoms may be written as shown.

$^{52}_{23}X$ $^{52}_{24}Y$

Which statement about these atoms is correct?

A. They are different elements because they have different numbers of neutrons.
B. They are different elements because they have different numbers of protons.
C. They are isotopes of the same element because they have the same nucleon number.
D. They are isotopes of the same element because they have the same proton number.

5. Which substance(s) exist in diatomic form?

1 Sodium chloride
2 Chlorine
3 Lead bromide

A. 1 only B. 2 only C. 1 and 3 D. 1, 2 and 3

6. Hydrogen and chlorine react as shown.

1 molecule of hydrogen + 1 molecule of chlorine → 2 molecules of hydrogen chloride

What is the equation for this reaction?

A. $2H + 2Cl \rightarrow 2HCl$
B. $2H + 2Cl \rightarrow H_2Cl_2$
C. $H_2 + Cl_2 \rightarrow 2HCl$
D. $H_2 + Cl_2 \rightarrow H_2Cl_2$

7. The table gives the solubility of four substances in ethanol and in water.
A mixture containing all four substances is added to ethanol, stirred and filtered.

The solid residue is added to water, stirred and filtered.

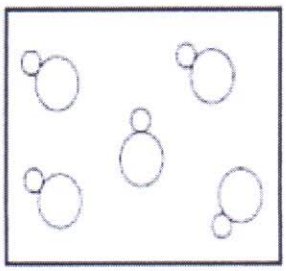
The filtrate is evaporated to dryness, leaving a white solid.

Which is the white solid?

	solubility in	
	ethanol	water
A	insoluble	insoluble
B	insoluble	soluble
C	soluble	insoluble
D	soluble	soluble

8. In the diagrams, circles of different sizes represent atoms of different elements.
Which diagram represents hydrogen chloride gas?

A



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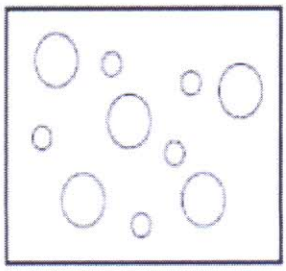

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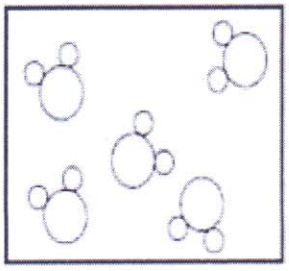

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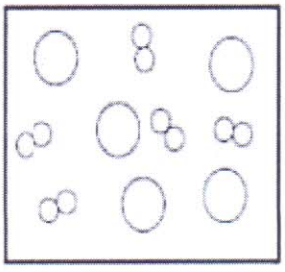


9. What is the relative molecular mass (Mr) of HNO_3?

A. 5 B. 31 C. 32 D. 63

10. An element Y has the proton number 18.

The next element in the Periodic Table is an element Z.

Which statement is correct?

A. Element Z has one more electron in its outer shell than element Y.
B. Element Z has one more electron shell than element Y.
C. Element Z is in the same group of the Periodic Table as element Y.
D. Element Z is in the same period of the Periodic Table as element Y.

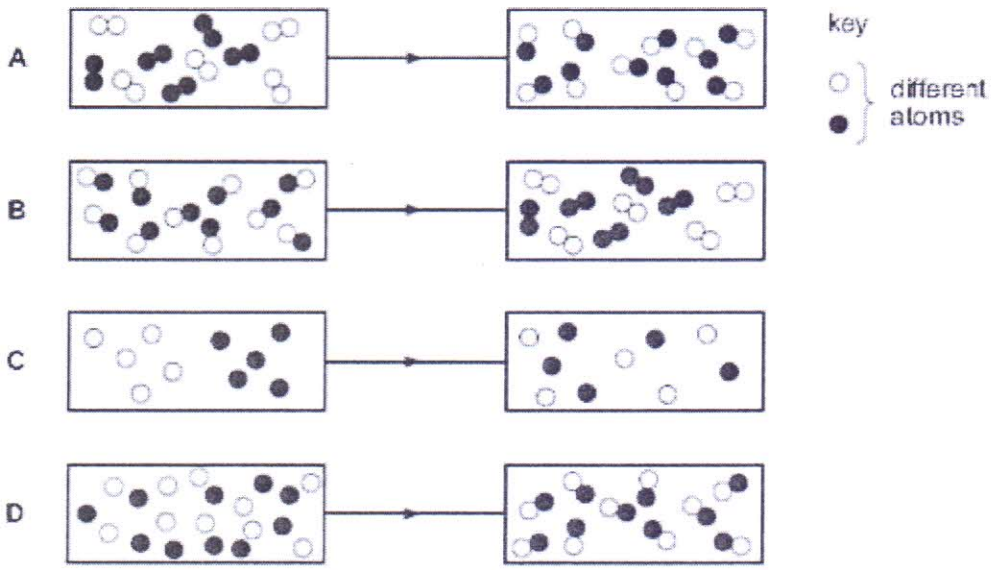
11. Which is a simple molecule have two atoms.

	conducts electricity		volatile
	when solid	when molten	
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

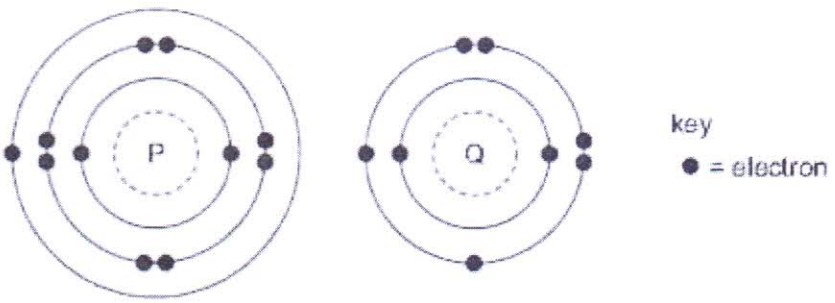
12. Element X belongs to III group of periodic table and element Y is in group VI of the periodic table. What is the formula of compound formed the reaction of X and Y?

A. XY
B. X_3Y
C. X_2Y_3
D. X_2Y

13. Which diagram shows the process of diffusion?



14. The electronic structures of atoms P and Q are shown.



P and Q react to form an ionic compound.
What is the formula of this compound?

A. PQ_2 B. P_2Q C. P_2Q_6 D. P_6Q_2

15. Which of the following substance reacts with water to produce colourless gas.
    A. Gold
    B. Sodium carbonate
    C. Calcium oxide
    D. Sodium

16. A student bubbled chlorine gas in sodium iodide solution. What is observed by the student.
    A. grey solid is formed
    B. colourless gas is formed
    C. brown gas is formed
    D. no reaction

17. Which property is same for sodium and rubidium?
    A. number of molecules
    B. mass
    C. volume at r.t.p
    D. number of electrons in outer shell.

18. what is the relative molecular mass of $(NH_4)_2SO_4$?
    A. 106
    B. 132
    C. 118
    D. 98

19. Which pair of elements form coloured compound?
    A. sodium and lead
    B. iron and calcium
    C. copper and iron
    D. calcium and aluminium

20. Name the technique used to separate the pigments in the mixture.
    A. filtration
    B. distillation
    C. chromatography
    D. crystallization

21. Which property is same for carbon monoxide and nitrogen?
    A. number of atoms
    B. number of moles
    C. rate of diffusion
    D. none of these

22. Which one of the following liquids conducts and electric current without a chemical change taking place?
    A. liquid gold
    B. sugar solution
    C. pure water
    D. concentrated sodium chloride

23. Which one of the following solids does not conduct electricity?
    A. ice
    B. graphite
    C. gold
    D. copper

24. 20 cm^3 of ethene (C_2H_4) diffused through a porous pot in 40 seconds. How long will it take for 20cm^3 of nitrogen gas to diffuse under the same conditions of room temperature and pressure?
    A. 10 seconds
    B. 20 seconds
    C. 40 seconds
    D. 80 seconds

25. Which one of the following statements concerning compounds is incorrect?
    A. the amount of elements in a compound is in a fixed ratio.
    B. the properties of a compound are very different form the elements it contains.
    C. a compound can be separated into its elements by chemical methods.
    D. no energy changes take place when a compound is formed.

26. An element Z is in group VI of the periodic table. Which one of the following formulae is incorrect?
    A. Z^{2-}
    B. H_2Z
    C. Z_2O_3
    D. ZO_4^{2-}

27. What is the percentage of carbon in carbondioxide?
    A. 12%
    B. 50%
    C. 27.27%
    D. 33.33%

28. Which one of the following can displace sodium from sodium chloride?
    A. Lithium
    B. Potassium
    C. Calcium
    D. Nitrogen

29. Binary compounds of oxygen are called oxides. Which oxide has highest percentage of oxygen?
    A. MgO
    B. SO_3
    C. Al_2O_3
    D. CO_2

30. Metal carbonates reacts with acid to produce carbon dioxide gas which piece of apparatus is used to collect the volume of carbon dioxide gas?
    A. burette
    B. pipette
    C. syringe
    D. beaker