**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**SECONDARY SCHOOL CERTIFICATE**

**CLASS IX EXAMINATION**

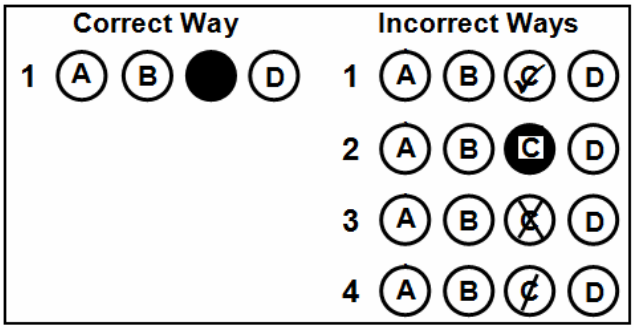
**MAY 2015**

**Chemistry Paper I**

**Time: 35 minutes Marks: 25**

**INSTRUCTIONS**

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 25 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.




**Candidate's Signature**

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a simple calculator if you wish.

1. If the empirical formula of a compound is $CH_2O$ and its molecular mass is 90, what will be its molecular formula?

   A. $CH_2O$
   B. $C_2H_4O_2$
   C. $C_3H_6O_3$
   D. $C_4H_8O_4$

2. Methane undergoes chlorination explosively in the presence of bright sunlight. The equation for the reaction is given below.

   $CH_4 + xCl_2 \rightarrow C + yHCl$

   In the above reaction, what are the values of $x$ and $y$?

   A. $x = 2, y = 4$
   B. $x = 2, y = 2$
   C. $x = 4, y = 4$
   D. $x = 4, y = 2$

3. Assume that X is the symbol of group IA element and Y is the symbol of group VIA element.

   When X reacts with Y, it will form a compound with the formula

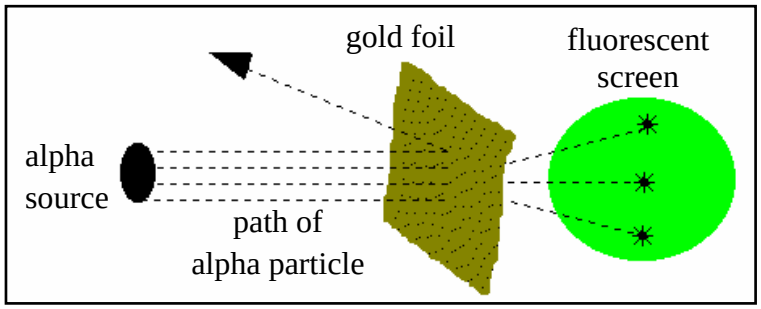
   A. XY
   B. $X_2Y$
   C. $XY_2$
   D. $X_6Y$

4. Which of the following is the electronic configuration of a calcium ion $(^{40}_{20}Ca^{2+})$?

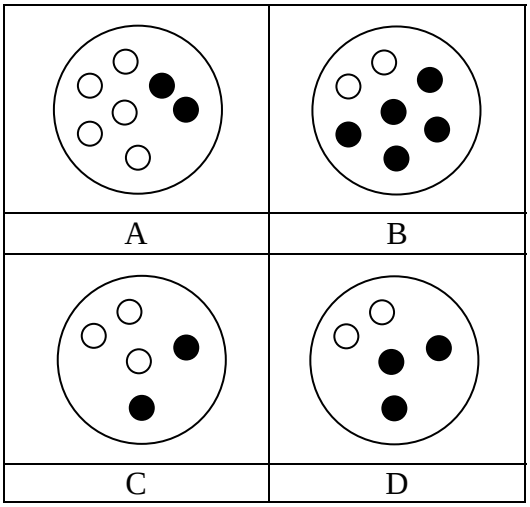
   A. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
   B. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
   C. $1s^2 2s^2 2p^6 3s^2 3p^6$
   D. $1s^2 2s^2 2p^6 3s^2$

5. In Rutherford's gold foil experiment, the complete re-bouncing of alpha particles showed that the nucleus of an atom is

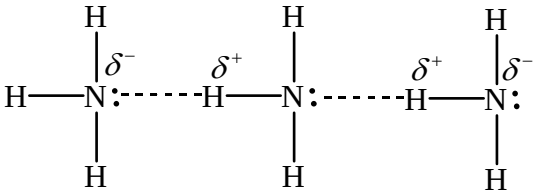
   A. large.
   B. small.
   C. negatively charged.
   D. positively charged.



6. Which diagram represents the nucleus of an atom with atomic mass 5 and atomic number 2? [NOTE: ○ = protons and ● = neutrons]




7. Which force of attraction is represented by the dotted lines between the molecules of the given compound?



A. Hydrogen bonding
B. Covalent bonding
C. Dipole-dipole interaction
D. Co-ordinate covalent bonding

8. In a molecule of ethyne, how many electron pairs are involved in the bonding between carbon-carbon atoms?

A. 2
B. 3
C. 4
D. 6

9. In which of the following pairs do both compounds have ionic bonding?

A. $H_2$ and $O_2$
B. $CaF_2$ and KI
C. HCl and $H_2O$
D. $C_6H_{12}O_6$ and $CH_4$

10. Given below is the period 3 of the modern periodic table.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Na** Sodium | **Mg** Magnesium | **Al** Aluminium | **Si** Silicon | **P** Phosphorus | **S** Sulphur | **Cl** Chlorine | **Ar** Argon |

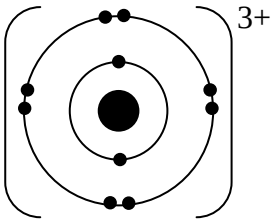
Which of the following elements will have the highest electronegativity?

A. Argon
B. Silicon
C. Chlorine
D. Magnesium

11. Phosphorus ($^{31}_{15}P$) will have similar chemical properties to that of an element with the atomic number

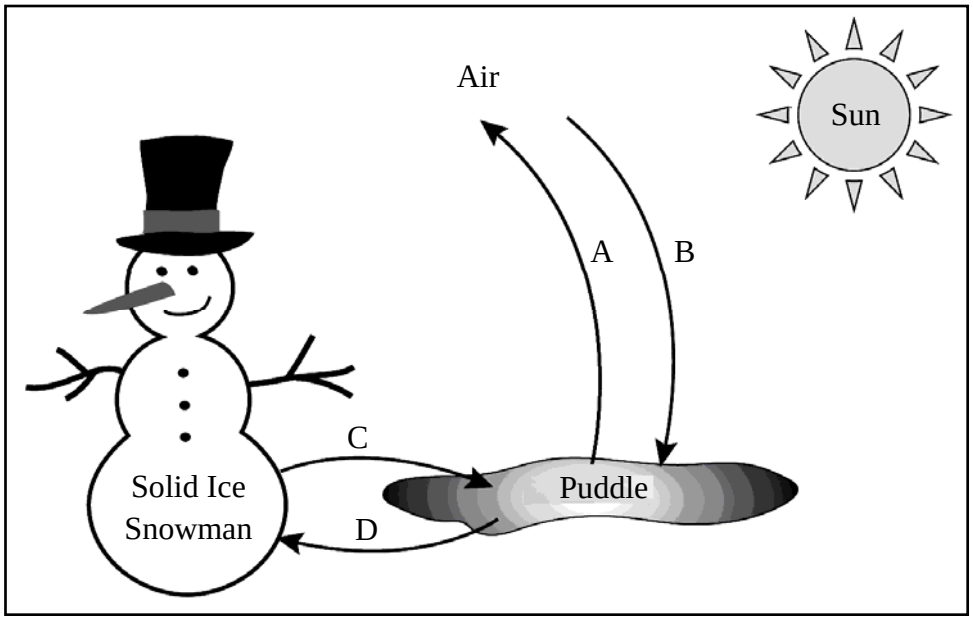
A. 8
B. 7
C. 5
D. 3

12. The given ion is formed from an element belonging to which group in the modern periodic table?




A. IIA
B. IIIA
C. VA
D. VIIIA

13. In the given diagram, which of the following represents the process of evaporation?



14. Which of the following statements about the behaviour of gases is FALSE?

    A. Gases are easily compressed.
    B. Gases occupy all available space.
    C. Gas particles possess orderly arrangement.
    D. Gas particles possess very high kinetic energy.

15. Under the same conditions of temperature and pressure, which of the following molecules of gases will diffuse the fastest through air? [NOTE: Atomic mass of O = 16 amu, Cl = 35.5 amu, N = 14 amu, C = 12 amu and H = 1 amu]

    A. $O_2$
    B. $Cl_2$
    C. $NO_2$
    D. $CH_4$

16. A teacher asks a student to dissolve 2.5 g of sodium carbonate in 50 g of water. What will be the concentration of the prepared solution?

    A. 4.76%
    B. 5.00%
    C. 47.6%
    D. 95.2%

17. A scientist prepares 0.125 M sodium chloride stock solution. What volume of the stock solution is required to prepare a 100 mL dilute solution of 0.05 M?

    A. 20 mL
    B. 40 mL
    C. 60 mL
    D. 100 mL

18. Which of the following statements defines a solution?

    A. A pure compound having one or more solutes dissolved in a solvent
    B. A heterogeneous mixture having one or more solutes dissolved in a solvent
    C. A homogeneous mixture having one or more solutes dissolved in a solvent
    D. A pure compound having a solute and a solvent mixed in a fixed ratio by mass

19. All of the following are measures for the protection of an iron rod against rusting EXCEPT

    A. alloying iron with other metals.
    B. exposing the iron rod to moist air.
    C. greasing the surface of the iron rod.
    D. painting the surface of the iron rod.

20. Which of the following conducts electricity?

A. Cooking oil
B. Molten sugar
C. Ethyl alcohol
D. Hydrochloric acid

21. Which of the following statements is TRUE for an electrolytic cell?

A. It converts chemical energy into electrical energy.
B. It consists of two half cells with different electrolytes.
C. It uses current to carry out a non-spontaneous chemical reaction.
D. It uses a salt bridge to provide a pathway for the migration of ions.

22. Which of the following statements is FALSE for soft metals?

A. They are easy to break.
B. They have low binding energies.
C. They belong to d-block of the periodic table.
D. They have less delocalized electrons than hard metals.

23. The first and second ionization energies of two elements, **X** and **Y**, are given in the table below.

| **Element** | **I.E.$_1$ (kJ mol$^{-1}$)** | **I.E.$_2$ (kJ mol$^{-1}$)** |
|---|---|---|
| **X** | 737 | 1450 |
| **Y** | 496 | 4563 |

On the basis of the given data, **X** and **Y** could be

| | **X** | **Y** |
|---|---|---|
| A | Mg | Na |
| B | Na | Mg |
| C | Na | K |
| D | K | Na |

24. Which of the following reactions of a halogen with the salt of an alkali metal is CORRECT?

A. $2KI + Cl_2 \rightarrow 2KCl + I_2$
B. $2KBr + I_2 \rightarrow 2KI + Br_2$
C. $2KCl + I_2 \rightarrow 2KI + Cl_2$
D. $2KCl + Br_2 \rightarrow 2KBr + Cl_2$

25. Which of the following reacts the most vigorously with dilute acids to produce hydrogen gas and salt?

A. Zinc
B. Silver
C. Copper
D. Calcium

END OF PAPER

# Please use this page for rough work

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