DELHI PUBLIC SCHOOL NEWTOWN
SESSION: 2021-22

HALF YEARLY EXAMINATION

CLASS: IX **FULL MARKS: 50**
SUBJECT: CHEMISTRY (PAPER 1) **DATE: 31.8.2021**

Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during the first 15 minutes.
This time is to be spent in reading the Question Paper.

Section I is compulsory. Attempt any four questions from Section II.
The intended marks for questions or parts of questions are given in brackets [ ].

SECTION I (10 Marks)

Attempt all questions from this Section

Question: 1

a. State the following:

i) A metal whose nitrate on heating leaves a silvery residue.
ii) A sublimable solid which on heating leaves no residue.
iii) The electronic configuration of F^{1-}.
iv) The valency of an element whose electronic configuration is 2, 8, 3.
v) The standard pressure of a gas in cm. of mercury corresponding to one atmospheric pressure.

b. Complete the table below, with the elements E, F, G, H, such that element E is an inert gas having electronic configuration 2, 8.

Elements	Atomic number	Electronic configuration
E	Z	2, 8
F	Z – 1	-------
G	Z + 1	--------
H	Z + 4	--------

c. Identify the substance oxidised and the substance reduced in the following reactions.

i) $2PbO + C \longrightarrow 2Pb + CO_2$
ii) $MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + Cl_2$ **[5+3+2=10]**

SECTION II (40 Marks)

Attempt any <u>four</u> questions from this Section

Question: 2

a. What would you observe when:

i) Blue vitriol is heated strongly in a test tube.
ii) Sodium hydroxide solution is added to zinc sulphate solution.
iii) Dilute sulphuric acid is added to sodium sulphite.
iv) Calcium bicarbonate is heated in test tube.
v) Concentrated sulphuric acid is added to a piece of copper.

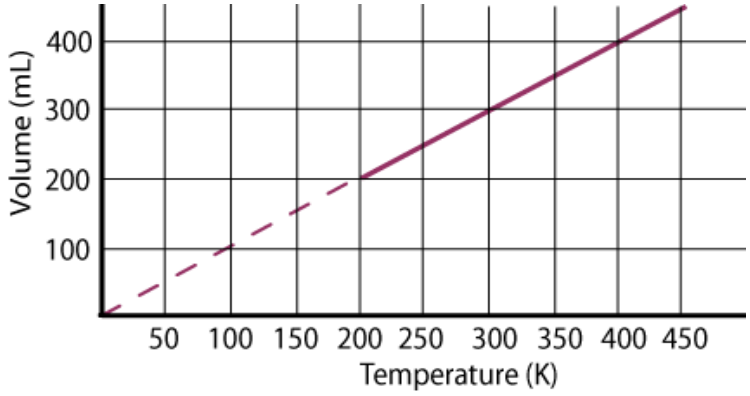
b. Calculate the percentage of chromium in ammonium dichromate. [N=14, Cr=52, O=16, H=1]

c. A volume of 2.4 litres of air at $17^{O}C$ is cooled to $-77^{O}C$ and the pressure on it is doubled. Calculate the final volume. [5+3+2=10]

Question: 3

a. A white crystalline salt [A] on heating decomposes with a crackling sound produces a reddish brown gas [B] which turns acidified ferrous sulphate solution brown, a colourless, odourless gas [C], which rekindles a glowing splinter and leaves behind a yellow residue[D]. Identify A, B, C and D. Write a balanced chemical equation for the same.

b. Use the following graph of Volume vs Temperature to answer the following questions.



i) As the temperature of the gas increases from 250 K to 350 K, does the volume of the gas increase or decrease?

ii) Which law states the relationship between volume and temperature at constant pressure?

iii) With reference to the graph, define "Absolute Temperature".

c. Write the chemical name of the following:

i) Na_2PbO_2

ii) Zn_3P_2 [5+3+2=10]

Question: 4

a. Give reasons for the following statements:

i) Neon is chemically inert.

ii) Isotopes of chlorine have same chemical properties.

iii) It is necessary to compare the gases at STP.

iv) Concentrated sulphuric acid is not used as a drying agent during the laboratory preparation of hydrogen.

v) Hydrogen peroxide is kept in dark coloured bottles.

b. Give balanced chemical equations to prepare the following substances by using the method indicated alongside each:

i) Mercury - decomposition

ii) Ferrous sulphate - displacement

iii) Lead chloride - double decomposition

c. $M(NO_3)_2$ is the formula of nitrate of a metal M. Write down the formula of its oxalate and phosphite. [5+3+2=10]

Question: 5

a. **Give balanced equation for the following reactions:**
   i) **Action of heat on anhydrous ferrous sulphate crystals.**
   ii) **Chlorine gas is passed through a solution of potassium iodide.**
   iii) **Addition of dilute sulphuric acid to ferrous sulphide.**
   iv) **Passage of steam over red hot iron.**
   v) **Thermal dissociation of dinitrogen tetroxide**

b. **Calculate the volume at STP occupied by a gas originally 760cc at 300K and 70cm. pressure of Hg.**

c. **When hydrogen is passed over a black solid A, the products are a colourless liquid and a reddish brown metal B. Name the substances A and B.** **[5+3+2=10]**

Question: 6

a. **Answer the following questions:**
   i) **P, Q and R are metals. Q liberates hydrogen from cold water whereas P and R do not. R displaces P from an aqueous solution of one of its salts. Place P, Q and R in order of decreasing activity.**
   ii) **An important step in the manufacture of hydrogen by the Bosch Process is that a mixture of hydrogen and carbon monoxide with steam is passed over iron oxide to about $500^{O}C$. Write the relevant chemical equation for that.**
   iii) **A unipositive ion of an element X has 21 neutrons and 18 electrons. Give the symbolic representation of an atom of X.**
   iv) **Write the chemical formula of calcium manganate.**
   v) **State the valency of nitrogen in nitric acid.**

b. **Complete the following equations with electrons:**
   i) $Cl^{-} \rightarrow Cl$
   ii) $Hg^{2+} \rightarrow Hg^{1+}$
   iii) $H \rightarrow H^{1-}$

c. **Define pressure-volume law. Represent it graphically.** **[5+3+2=10]**