

(Candidates are allowed the first fifteen minutes to read the question paper. They must not start writing at this point of time). Answer **all** questions from Section - A and any **four** from Section -B . The marks allotted for each question is shown in [ ] brackets. For numerical, students must show the calculations in the same page where the problems are answered.

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### Section - A

(Attempt **all** the questions from this section)

Q1.A) Name the following:-

[5]

1. A metallic oxide which decomposes on heating-
2. A liquid acting both as oxidising as well as a reducing agent-
3. A neutral oxide which exists in liquid state at room temperature-
4. A blue crystalline salt which on heating changes to white-
5. The type of bond present in chlorine molecule-

B) State your observation for each of the following: [5]

1. Sodium sulphate solution is added to lead nitrate solution.
2. Hydrogen sulphide is passed through copper sulphate solution.
3. Conc. sulphuric acid is added to hydrated copper sulphate.
4. Hydrogen gas is passed through ferric oxide.
5. Hydrochloric acid is added to sodium bicarbonate.



C) Complete the following table which refers to the action of heat on three substances named in the first column. [5]

Substances	Colour before heating	Name of the residue	Colour of the residue	Name of the gas
i. Cupric carbonate	-----	-----	-----	-----
ii. Lead nitrate	-----	-----	-----	----- , oxygen
iii. Zinc carbonate	white	-----	-----	Carbon dioxide

D) Solve the following numericals:- [2+3=5]

1. Hydrogen gas occupies a volume of  $400 \text{ cm}^3$  at a temperature of  $27^\circ\text{C}$  and at constant pressure. Find the volume of the gas at  $10^\circ\text{C}$ .
2. The volume of certain gas was found  $400 \text{ cm}^3$ , when the pressure was 520 mm of Hg. If the pressure is increased by 30%, find the new volume of the gas.

E) Fill in the blanks:- [5]

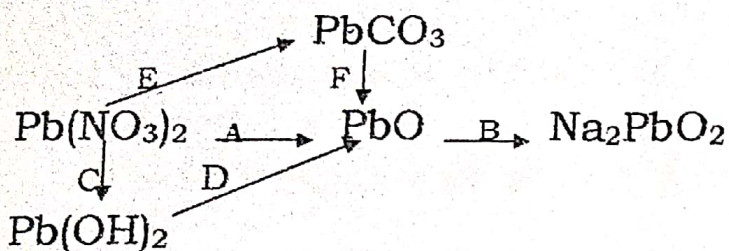
1. When sodium nitrate is heated, the gas evolved is -----.
2. When a piece of calcium is dropped in water, it becomes cloudy after sometime due to formation of -----.
3. The highly non-metallic elements are present on ----- side of the Periodic Table.
4. Isotopes differ in the no. of -----.
5. ----- is the salt of calcium that causes temporary hardness of water.

F) Balance the following equations :- [5]

1.  $\text{C}_2\text{H}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
2.  $\text{Ag}_2\text{CO}_3 \rightarrow \text{Ag} + \text{CO}_2 + \text{O}_2$
3.  $\text{NaOH} + \text{Cl}_2 \rightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$
4.  $\text{P} + \text{HNO}_3 \rightarrow \text{H}_3\text{PO}_4 + \text{NO}_2 + \text{H}_2\text{O}$
5.  $\text{NH}_3 + \text{Cl}_2 \rightarrow \text{N}_2 + \text{NH}_4\text{Cl}$



G) Give balanced chemical equation for the following conversions: [6]



H) Chemically distinguish between:- [4]

- Carbon dioxide and ammonia
- Hydrogen sulphide and chlorine
- Nitrogen dioxide and sulphur dioxide
- Hydrogen chloride and ammonia

### Section B

(Attempt any four from the following)

Q2.a) Calculate the percentage of sodium in sodium aluminium fluoride ( $\text{Na}_3\text{AlF}_6$ ). [Na=23,Al=27,F=19] [2]

b) Give reason:- [3]

- Ferric chloride is kept in air-tight bottles.
- Atom is electrically neutral.
- Ionic compounds are highly stable.

c) Draw the electron dot structure of calcium oxide and carbon tetrachloride. [2]

d) With the help of equations, show the formation of nitric acid in the atmosphere during acid rain. [3]

Q3.a. Write the chemical name and formula of i. plaster of paris and ii. washing soda. [2]

b. Convert:- [3]



- i. Copper sulphate to copper hydroxide.
- ii. Carbon to carbon disulphide.
- iii. Calcium bicarbonate to calcium carbonate.

c. Name:-

[2]

- i. The oxidised product obtained when hydrogen sulphide reacts with chlorine-
- ii. The oxide obtained when iron reacts with steam-

d. Give reason:-

[2+1=3]

- i. An aqueous solution of ammonium chloride is acidic in nature while aqueous solution of sodium chloride is neutral in nature.
- ii. An atom can have a fractional atomic mass.

Q4.a) Arrange:-

[2]

- i. I, Cl, F, Br (increasing reactivity)
- ii. Cs, Li, Na, K, Rb (decreasing reactivity)

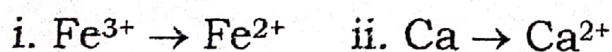
b) Using hydrogen as one of the reactant how would you obtain the following:-

[3]

- i. An acidic gas using another acidic gas.
- ii. A free metal from a black basic oxide.
- iii. A basic gas using an unreactive gas.

c) Complete and identify the following as oxidation or reduction:-

[2]



d) Match the following:-

[3]

**LIST 1**

- i. Carbon
- ii. Nitric acid
- iii. Molybdenum

**LIST 2**

- A. Promoter
- B. Reducing agent
- C. Oxidising agent
- D. Catalyst

Q5.a) Chemically distinguish between:-

[2]

- i. Mg and Cu
- ii. Sodium sulphide and sodium sulphite



b) 2.5 dm<sup>3</sup> of dry nitrogen gas is collected at a temperature of 27 ° C and a pressure of 740 mm Hg. Find the volume of the gas at S.T.P. [3]

c) Name the drying agents for i. hydrogen chloride and ii. Ammonia. [2]

d) Name:- [3]

- i. Anhydrous crystalline salt of potassium which is purple in colour-
- ii. A decahydrate salt that shows anomalous solubility-
- iii. A hydrated crystalline salt which is green in colour-

Q6. a) An atom of an element has 3 electrons in M shell. i. What is the atomic number of this element? ii. Write the number of electrons in the **ion** of this element. [2]

b. Select the odd one out and give reason:- [3]

- i. F, Cl, Br, Na
- ii. Ne, Ar, Fr, Kr
- iii. Li, Al, Na, K

c. Calculate the no. of protons and neutrons in (i)  ${}_{92}\text{U}^{235}$  and (ii)  ${}_{18}\text{Ar}^{40}$  [2]

d. Give equations for the effect of heat on i. red lead ii. lead dioxide iii. sodium bicarbonate. [3]

Q7. a) Which electrons has maximum and minimum energy? [2]

- i. electrons present in K shell
- ii. electrons present in N shell

b) The following questions are related with the manufacture of hydrogen by Bosch process. [5]

- i. Give equations for the preparation of hydrogen with proper conditions.
- ii. Why the temperature of coke falls during the formation of water gas?
- iii. Name two other gases which are produced along with hydrogen.
- iv. How are the above mentioned gases removed from hydrogen?



c) An orange solid 'A' on heating erupts in the form of volcano to form compound 'B' and two gases 'C' and 'D'. 'D' can be condensed to a colourless liquid. i. Identify A, B, C, and D. ii. Give balanced chemical equation for the action of heat on A and mention the colour of B. [3]

