



ST. JOSEPH'S COLLEGE, PRAYAGRAJ

FINAL EXAMINATION 2024-25

CHEMISTRY

CLASS – IX

TIME: 2 Hours

MM: 80

Section – A

(Attempt all questions)

Q 1) Choose the most appropriate answer for each of the following:

[15]

1. According to Dobereiner's triads, the first element (X) and the third element (Z) have atomic masses 40 and 137 respectively. The atomic mass of the middle element (Y) in a triad is:

- (a) 88.5 (b) 40.5 (c) 80.5 (d) 86.5

2. Assertion (A): The balancing of chemical equation is based on law of conservation of mass.

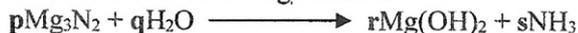
Reason (R): Total mass of reactants is equal to total mass of products.

- (a) Both Assertion and Reason are true
(b) Both Assertion and Reason are false.
(c) Assertion is true but Reason is false.
(d) Assertion is false but Reason is true.

3. When copper carbonate is heated strongly, the colour of the residue formed is:

- (a) Black (b) Yellow when hot and white when cold
(c) Red (d) White when hot and yellow when cold

4. Consider the following reaction:



When the equation is balanced, the coefficient p,q,r and s respectively is

- (a) 1,3,3,2 (b) 1,2,3,2 (c) 1,6,3,2 (d) 2,3,6,2

5. The valency of iron in FeO is:

- (a) +1 (b) +3 (c) +2 (d) +2 and +3

6. Assertion (A): Charle's law is valid only when the pressure of the system is kept constant.

Reason (R): As the pressure is kept constant, the gases, when heated will achieve high kinetic energy, which in turn help the molecules to overcome the intermolecular forces in them and undergo compression.

- (a) Both Assertion and Reason are true
(b) Both Assertion and Reason are false.
(c) Assertion is true but Reason is false.
(d) Assertion is false but Reason is true.

7. At constant temperature, if the pressure is doubled for a fixed mass of a gas, its volume will become:

- (a) half times (b) 4 times (c) 2 times (d) 8 times

8. In which of the following octet of atom is not complete?

P: H₂ Q: Cl₂ R: O₂ S: N₂

- (a) Only P (b) Only Q (c) Both P and Q (d) Only S

9. The number of valence electron(s) in N⁻³ is

- (a) 6 (b) 4 (c) 10 (d) 8

10. The metal which does not form an amphoteric oxide:

- (a) Aluminium (b) Zinc (c) Lead (d) Sodium

11. Mrs. Sharma has tried to dissolve sugar cubes in water at a given temperature. After some time she found that the sugar cubes had settled down at the bottom of the beaker. The type of solution she has is:

- (a) Unsaturated solution (b) Supersaturated solution (c) Crystallisation (d) Saturated solution

12. If the temperature is 298K, what will be its value in degree Celsius?

- (a) 25° C (b) 27° C (c) -25° C (d) -26° C

13. A salt commonly called as caustic potash:

- (a) KOH (b) NaOH (c) Ca(OH)₂ (d) Zn(OH)₂

14. In (NH₄)_x SO₄, the value of x is:

- (a) 2 (b) 1 (c) 3 (d) 4

15. A gas which gives dense white fumes with ammonium hydroxide:

- (a) Hydrogen chloride gas (b) Oxygen (c) Ammonia (d) Carbon dioxide

Q 2) i) Fill in the blanks with the choices given in the bracket:

[5]

- (a) The vertical columns in which elements are arranged in modern periodic table are called as _____ (group/period)
(b) Symbolic representation of a molecule is called _____.



- (c) The charged particles are called as _____ (ions/atoms).
 (d) In covalent compound, the bond formed is due to _____ (transfer/sharing) of electrons.
 (e) Eka-aluminium is _____. (Gallium/ Germanium)

ii) What do you observe when:

[5]

- (a) Ammonium dichromate is heated.
 (b) Sulphur dioxide is passed through acidified $K_2Cr_2O_7$ solution.
 (c) Iodine crystals are heated.
 (d) Nitrogen dioxide is passed through acidified ferrous sulphate solution.
 (e) Carbon dioxide is passed through lime water in excess.

iii) Identify the term/gas/ substance in each of the following:

[5]

- (a) The theoretical temperature at which the molecular motion completely ceases.
 (b) Atoms of the same chemical element that have the same number of protons but different number of neutrons.
 (c) The rise in average temperature of earth's surface.
 (d) A gas which contribute towards green house effect.
 (e) $1/12$ the mass of carbon atom C-12.

iv) Balance the following reactions:

[5]

- (a) $Pb(NO_3)_2 \longrightarrow PbO + NO_2 + O_2$
 (b) $S + H_2SO_4 \longrightarrow SO_2 + H_2O$
 (c) $NH_3 + Cl_2 \longrightarrow NH_4Cl + N_2$
 (d) $PbO + NH_3 \longrightarrow Pb + H_2O + N_2$
 (e) $CaCO_3 + HCl \longrightarrow CaCl_2 + H_2O + CO_2$

v) Give reason:

[5]

- (a) Common salt becomes sticky during the rainy season.
 (b) Blue vitriol changes to white upon heating.
 (c) Granulated zinc is used in the laboratory preparation of the hydrogen.
 (d) Mountaineers carry oxygen cylinder with them.
 (e) It is necessary to specify the pressure and temperature of a gas while stating its volume.

Section – B

(Attempt any 4 questions)

Q 3) (a) An atom of an element has three electrons in the M-shell. What is:

[2]

- i. The atomic number of this element.
 ii. The number of electron(s) present in its ion.

(b) Name:

[2]

- i. Two carbonates that do not produce carbon dioxide on heating.
 ii. A greenish yellow gas.

(c) Copy and complete the following blanks in the given table on the basis of manufacturing of hydrogen gas.

[3]

Name the process	Balanced chemical reaction involved	Impurities formed
A) -----	B) $C + H_2O \xrightarrow{1000^\circ} (CO + H_2) - \text{heat}$	D) Carbon monoxide
	C) -----	E) -----

(d) Answer the following questions:

[3]

- i. State the Boyle's law.
 ii. A given mass of a gas occupies 143cm^3 at 27°C and 700mm Hg pressure. What will be its volume at 300K and 280mm Hg pressure?

[2]

Q 4) (a) Give reason: [2]

- Inert gases are monoatomic.
- Boiled or distilled water tastes flat.

(b) Which reagent is used to remove the following impurities formed during the preparation of hydrogen gas in the laboratory? [2]

- Arsine and Phosphine
- Hydrogen sulphide

(c) Study the table given below and answer the following questions: [3]

Element	Mass number	Atomic number
A	1	1
B	14	7
C	40	20
D	32	16
E	20	10

- Identify the element having no neutron.
- Identify the element exhibiting +2 valency.
- Identify the element having 5 valence electrons

(d) MNO_3 is a formula of a nitrate of a metal M. Write down the formulae of: [3]

- Oxide of M
- Nitride of M
- Sulphate of M

Q 5) (a) Give a chemical test to distinguish between the following gases: [2]

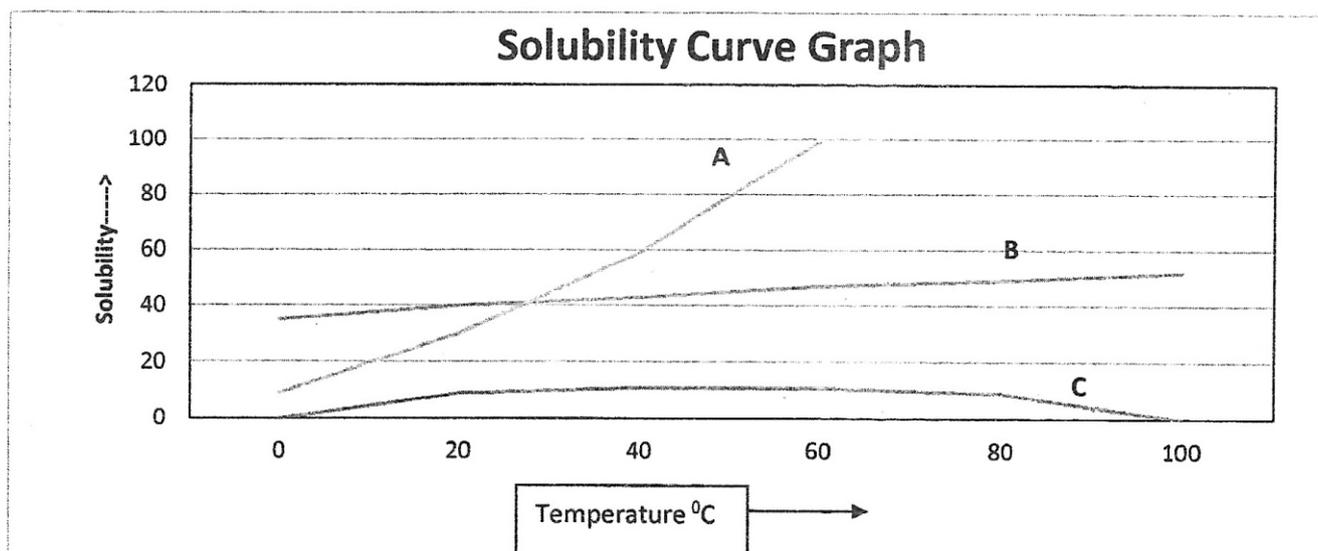
- Hydrogen and Oxygen.
- Sulphur dioxide and hydrogen sulphide.

(b) The presence of a gas at STP is doubled and the temperature is raised to 546 K. What is the final volume of the gas? [2]

(c) What is the valency of nitrogen in the following compounds: [3]

- N_2O_3
- NO_2
- NO

(d) Predict the name of solids given as A, B and C showing the variation insolubility with changing temperature in the following solubility curve graph [3]



Q 6) (a) Calculate the relative molecular masses of: [2]

- Glucose
- Caustic soda

(RAM is C=12, H=1, O=16, Na=23)

(b) State whether the underlined species are oxidised or reduced: [2]

- $\underline{\text{Fe}^{3+}} + 1e^- \longrightarrow \text{Fe}^{2+}$
- $\underline{\text{Al}} \longrightarrow \text{Al}^{3+} + 3e^-$
- $\underline{\text{S}^{4+}} - 2e^- \longrightarrow \text{S}^{6+}$



(c) Write the chemical names of the following compounds: [3]

i. $\text{Ca}_3(\text{PO}_4)_2$

ii. $\text{Mg}(\text{HCO}_3)_2$.

iii. $(\text{NH}_4)_2\text{SO}_4$

(d) Calculate the final volume of a gas 'X', if the original pressure of the gas, at STP is doubled and its temperature is increased three times. [3]

Q 7) (a) Write two ways by which a saturated solution can be converted into unsaturated solution. [2]

(b) i. What is an acid rain? [2]

ii. Write two effects of acid rain.

(c) i. Differentiate between the temporary and permanent hardness of water [3]

ii. How can the temporary hardness be removed. (Support your answer by giving equations)

(d) What do you observe when: [3]

i. Ammonia gas is passed through Nessler's reagent.

ii. Cobalt chloride paper is introduced in water vapour.

iii. A piece of moist blue litmus paper is placed in a gas jar of chlorine.

Q 8) (a) How is ozone formed in the atmosphere? (support your answer with the help of an equation) [2]

(b) Calculate the percentage of the following: [2]

i. Nitrogen in Ammonia (NH_3)

ii. Oxygen in carbon carbonate (CaCO_3)

(c) Mr. Bhaskar has performed an experiment for the preparation of hydrogen in the laboratory. Answer the following questions based on it: [3]

i. materials used by him

ii. chemical equation involved.

iii. method of collection

(d) i. Define electrovalent bond. [3]

ii. Draw an orbital structure of:

1. calcium oxide

2. water molecule

[Given atomic weight : C=12, H=1, N=14, Ca=40, O=16].