DELHI PUBLIC SCHOOL NEWTOWN
SESSION: 2021-22

FINAL TERM EXAMINATION

CLASS: IX **TOTAL MARKS: 80**
SUBJECT: CHEMISTRY **TIME: 2 HOURS**

(Candidates are allowed additional 10 minutes for only reading the papers. They must NOT start writing during this time.)

The Question Paper comprises Two Parts. Part I is based on Multiple Choice Questions.
Part –II is based on Subjective questions.
The intended marks for questions are given in brackets. [ ]
This paper consists of seven printed pages.

Part –I

Attempt all question in Part I

Choose the correct answers to the questions from the given options (a to e). (Do not copy the question, write the correct answer only) **[30]**

1. **A hydrocarbon which is a greenhouse gas is:**
   - **(a) Acetylene**
   - **(b) Ethylene**
   - **(c) Methane**
   - **(d) Ethane**
2. **According to Boyle's Law, as the pressure increases, the volume:**
   - **(a) Increases**
   - **(b) Decreases**
   - **(c) Remains same**
   - **(d) First increases then decreases**
3. **When a non- metal atom becomes an ion:**
   - **(a) It loses electron and is oxidized**
   - **(b) It gains electron and is reduced**
   - **(c) It loses electron and is reduced**
   - **(d) It gains electron and is oxidized**
4. **On adding water to sodium, the solution formed is:**
   - **(a) Neutral**
   - **(b) Acidic**
   - **(c) Amphoteric**
   - **(d) Alkaline**

5. **The RMM of ammonium nitrate is 80. The percentage weight of nitrogen in it is:**
   - **(a) 35**
   - **(b) 17.5**
   - **(c) 52.5**
   - **(d) 0.35**
6. **The metalloid present in period 2 is:**
   - **(a) Silicon**
   - **(b) Boron**
   - **(c) Aluminium**
   - **(d) Carbon**
7. **A compound has the formula X_2Y, where Y denotes a non- metal. The formula of the compound formed between Calcium and Y will be:**
   - **(a) Ca_2Y**
   - **(b) CaY_2**
   - **(c) Y_2Ca**
   - **(d) CaY**
8. **The number of electrons and protons present in sulphide ion is:**
   - **(a) 16, 16**
   - **(b) 18, 16**
   - **(c) 18, 18**
   - **(d) 16, 18**
9. **A metallic nitrate which on decomposition gives a metallic oxide, nitrogen dioxide and oxygen is:**
   - **(a) Sodium nitrate**
   - **(b) Calcium nitrate**
   - **(c) Potassium nitrate**
   - **(d) Silver nitrate**
10. **When air is blown into a balloon, its pressure ___ and volume ___.**
   - **(a) Increases, decreases**
   - **(b) Decreases, increases**
   - **(c) Increases, increases**
   - **(d) Decreases, decreases**
11. **The air pollutant which is non- acidic is:**
   - **(a) Nitrogen dioxide**
   - **(b) Ozone**
   - **(c) Sulphur dioxide**
   - **(d) Sulphur trioxide**

12. Which one of the following has water of crystallization?

(a) Potassium chloride

(b) Potassium nitrate

(c) Washing soda

(d) Common salt

13. Drying agent used to dry hydrogen chloride gas is:

(a) Silica gel

(b) Fused calcium oxide

(c) Phosphorus pentoxide

(d) Concentrated sulphuric acid

14. A sample of a gas has a volume of 500cc at 373K. Calculate the temperature at which the volume becomes 260cc, assuming pressure is constant.

(a) 94K

(b) $79^{O}C$

(c) $-79^{O}C$

(d) $-194^{O}C$

15. An atom $_{20}Ca^{40}$ having unstable electronic configuration forms a compound with $_{8}Y^{16}$. The compound formed is ___ and the formula of the compound is ___.

(a) Electrovalent, X_2Y

(b) Covalent, X_2Y

(c) Electrovalent, XY

(d) Electrovalent XY_2

16. The formula of sodium borate is:

(a) $Na_3(BO)_3$

(b) $NaBO_3$

(c) Na_3BO_3

(d) $NaBO_2$

17. Substance used to remove phosphine from hydrogen is:

(a) Potassium hydroxide

(b) Lead nitrate

(c) Anhydrous calcium chloride

(d) Silver nitrate

18. The reducing agent in the reaction $2HgCl_2 + SnCl_2 \rightarrow Hg_2Cl_2 + SnCl_4$ is:

(a) $HgCl_2$

(b) $SnCl_2$

(c) Hg_2Cl_2

(d) $SnCl_4$

19. The metal above hydrogen in the metal activity series but does not react with dilute acids to liberate hydrogen is:

(a) Copper

(b) Lead

(c) Magnesium

(d) Zinc

20. Good oxidizing agents are:

(a) Alkali metals

(b) Alkaline earth metals

(c) Halogens

(d) Inert gases

21. Scandium was originally called:

(a) Eka-silicon

(b) Eka-germnium

(c) Eka- aluminium

(d) Eka- boron

22. A covalent molecule having two single covalent bonds is:

(a) Oxygen

(b) Hydrogen chloride

(c) Water

(d) Ammonia

23. A metal which cannot displace copper from copper nitrate solution is:

(a) Lead

(b) Silver

(c) Zinc

(d) Magnesium

24. The valency of copper in CuS is:

(a) 1

(b) 2

(c) 4

(d) 0

25. Temporary hardness in due to the presence of calcium and magnesium:

(a) Chlorides

(b) Sulphates

(c) Bicarbonates

(d) Carbonates

26. Oxygen accepts two electrons and attains the stable electronic configuration of:

(a) Helium

(b) Neon

(c) Argon

(d) Krypton

27. Carbon and ____is placed in the same group

(a) Beryllium

(b) Phosphorus

(c) Silicon

(d) Sulphur

28. The oxidized product formed when hydrogen peroxide is added to potassium iodide is:

(a) Water

(b) Potassium

(c) Oxygen

(d) Iodine

29. The final volume of a gas, if the pressure of the gas, originally at STP is doubled and its temperature is tripled is:

(a) Same as original volume

(b) Twice of the original volume

(c) 0.5 of the original volume

(d) 1.5 of the original volume

30. The gas that liberates iodine vapours from potassium iodide solution.

(a) Nitrogen

(b) Nitrogen dioxide

(c) Carbon dioxide

(d) Sulphur dioxide

Part II

SECTION I (10 Marks)

Attempt all questions from this Section

Question: 1

a. Name the following: [5]

i) The basic radical in K_2MnO_4.

ii) The gas evolved when copper carbonate is heated strongly.

iii) A liquid hygroscopic substance.

iv) The element present in period 3 and having four valence electrons.

v) The metal which is expensive and not used in the preparation of hydrogen from water.

b. Complete and balance the following reactions: [5]

i) $Al + NaOH + \_\_\_\_ \rightarrow \_\_\_\_\_ + \_\_\_$

ii) $FeSO_4$(on heating) $\rightarrow \_\_\_\_ + SO_3 + \_\_\_\_$

iii) $AgNO_3$ (on heating) $\rightarrow \_\_\_\_ + \_\_\_\_ + \_\_\_$

iv) $(NH_4)_2Cr_2O_7 \rightarrow \_\_\_\_ + \_\_\_\_ + \_\_\_\_\_$

v) $NO_2 + H_2O \rightarrow \_\_\_ + \_\_\_$

SECTION II (40 Marks)

Attempt any four questions from this Section

Question: 2

a. Hydrogen may be prepared in the laboratory by the action of a metal on an acid.

i) Which of the following metals copper, zinc, lead or sodium would be the most suitable one?

ii) How would you modify the apparatus to collect hydrogen gas safely?

iii) Which drying agent would you employ to collect dry hydrogen gas? [3]

b. Find the percentage of water in blue vitriol. (Cu=64, S=32, O=16) [3]

c. Give one example of a photochemical reaction involving- [2]

i) Silver salt

ii) Water

d. Complete the following oxidation/ reduction reaction and state which one is oxidation and reduction. [2]

i) $Mn^{7+} \rightarrow Mn^{5+}$

ii) $2Br^{-} \rightarrow Br_2$

Question 3

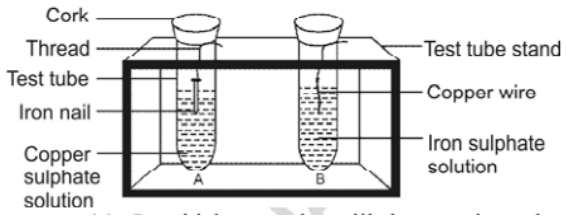
a. State if the solubility increases, decrease or remain the same with rise in temperature for each of the following compounds: [3]

i) Potassium nitrate

ii) Sodium chloride

iii) Calcium sulphate

b. Observe the two test tubes A and B in the diagram given below and answer the following questions: [3]



i) In which test tube will the reaction take place?

ii) Write a balanced equation of the reaction that will take place.

iii) Name the type of reaction.

c. Write a balance equation for the removal of: [2]

i) Permanent hardness

ii) Temporary hardness by addition of washing soda (in both cases)

d. Name a covalent molecule having two lone pair of electrons. Represent it with an orbit diagram. [2]

Question 4

a. At a constant temperature, a gas at a pressure of 750mm pressure occupies a volume of $100cm^3$. If the volume is decreased by 40%, then find the new pressure. [3]

b. Write the equations involved in the production of sulphur dioxide in the atmosphere that causes acid rain. [3]

c. Give reasons for the following: [2]

i) Dobereiner's method of classification of elements did not hold much weightage for future classification.

ii) Sodium is univalent.

d. Give the chemical name of: [2]

i) CaC_2O_4.

ii) NaClO

Question 5

a. State what do you observe: [3]

i) Iodine crystals are heated in a test tube

ii) Ferric chloride crystals are exposed to atmosphere for some time.

iii) Sodium hydroxide solution is added to ferrous sulphate solution dropwise, and then in excess.

b. A metal in period 3 burns with a lilac flame in air. It combines with oxygen and form a strong alkali. [3]

i) Name the metal.

ii) What is its atomic number?

iii) Write the formula of its plumbate.

c. $6dm^3$ of dry gas is collected at a temperature of 27^OC and pressure 700mm Hg. Find the volume of the gas at STP. [2]

d. Give reasons for the following: [2]

i) Acid rain causes nutrient leaching.

ii) Magnesium reacts with very dilute nitric acid at low temperatures liberating hydrogen.

Question: 6

a. Name the element present in: [3]

i) Group 1 and period 2

ii) Group 2 and period 3

iii) Group 14 and period 2

b. Atomic numbers of the elements A to E are given as: A= 7, B= 8, C=9, D=12, E=19

i) Which one is a divalent metal?

ii) What type of compound will it (metal in i) form with C?

iii) Draw an electron dot diagram to represent the compound formed in (ii) above.[3]

c. On heating a blue coloured powder of copper salt in a boiling tube, a black substance is left behind with the evolution of a colourless gas that rekindles a glowing splinter and on heating strongly a reddish brown gas is evolved. [2]

i) Write a balanced chemical equation for the above reaction.

ii) Identify the type of reaction.

d. Write the molecular formula for the following compounds: [2]

i) Lead chromate

ii) Aluminium carbide.