



The Times Secondary School

Dillibazar, Kathmandu

First Terminal Examination – 2076

Grade: - XI

Set – A

Full Marks:-75

Stream: Science

Pass Marks:-30

Subject: - Chemistry

Time : 3 hrs

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate the full marks.

Group A

Attempt any fifteen questions.

[15× 2=30]

1. Write acid radical and basic radical present in $\text{Cr}_2(\text{SO}_4)_3$. Why are they called so?
2. How would you apply the modern concept to determine valency of individual elements present in the molecule CH_3OH ?
3. Describe the quantitative significances of chemical reaction
 $\text{MgCO}_3 + \text{HCl} \longrightarrow \text{MgCl}_2 + \text{H}_2\text{O} + \text{CO}_2$
4. Define molar volume of gas at NTP or STP giving examples.
5. 5.6 lit of a gas at NTP weights 16 gm. Find its molecular mass.
6. Assume that human body contains of 80% of water. Calculate the number of molecules of water that are in the body of a person who has a mass of 70 kg.
7. How would you test the presence of $\text{Cl}^-_{(\text{aq})}$ ion and $\text{SO}_4^{2-}_{(\text{aq})}$ ion present in the solution? Give complete test reactions.
8. What is meant by periodicity? Explain with example.
9. Write any two successful points of Mendeleev's periodic law with examples.
10. Cl^- has larger size than K^+ though they have same number of electrons. Why? Explain.
11. Write major difference between ortho hydrogen and para hydrogen.
12. Define isotopes. Mention important uses of radioactive hydrogen.
13. Define mixed oxide. Mn_3O_4 is a compound oxide. Justify it.
14. How can ozone be prepared artificially? Explain with reactions
15. NH_3 gas can't be dried over conc H_2SO_4 , CaCl_2 and P_2O_5 . Why? Explain.
16. How does ammonia react with salts of mercury? Write two reactions.
17. Distinguish between
 - a. Minerals and Ores
 - b. Alloys and Amalgams
18. Define ferrous and non ferrous alloys. Discuss the reasons of alloying metals.

19. Define functional group. Write the functional groups of i) aldehyde ii) carboxylic acid
20. What are aromatic and alicyclic organic compounds? Explain with examples.
21. Catenation is the special fundamental property in organic compounds that results to existence of very large number of such compounds. Explain this statement with examples.
22. Explain why?
 - a) organic compounds undergo molecular type of reactions.
 - b) organic compounds are generally insoluble in water.

Group B

Attempt any five questions.

[5× 5= 25]

23. Describe the different types of chemical reactions with general representation and examples of each. Balance the reaction using partial equation method. 4+1
 $\text{K}_2\text{Cr}_2\text{O}_7 + \text{dil HCl} \longrightarrow \text{KCl} + \text{CrCl}_3 + \text{Cl}_2 + \text{H}_2\text{O}$
24. Calculate in each of the followings 2+1+2
 - a. how many moles of H_2 are left when 3×10^{22} molecules are removed from a vessel containing 40gm of H_2
 - b. How many number of oxygen atoms are required to produce 67.2 lit of CO_2 according to the following reaction.
 $\text{C} + \text{O}_2 \longrightarrow \text{CO}_2$
 - c. 6.3 gm of concentrated nitric acid is diluted by adding 68 gm of pure water. How many oxygen molecules are present in the solution?
25. Define ionization energy and successive I.E. Describe the important factors that affects magnitude of I.E with necessary examples. 2+3
26. Define oxides. Classify the following oxides giving necessary chemical explanation. a) NO b) BaO c) N_2O_5 d) ZnO e) RbO_2 5
27. What happens when? Explain 5
 - a. Ammonia solution is passed through Cu^{2+} solution dropwise till excess .
 - b. Liquid ammonia is treated with Fe^{3+} salt solution.
 - c. Excess ammonia is passed through chlorine gas.
 - d. Au metal is treated with aqua regia.
 - e. Freshly prepared FeSO_4 solution is passed through a solution containing nitrate ion and conc H_2SO_4 .

28. How is ammonia manufactured by Habers process in large scale ?
 Explain in detail. What chemical action takes place when ammonia is passed through heated CuO? 4+1
29. What is homologous series? Describe the important characteristics of homologous series taking reference example of alkanolic acid. 5

Group C

Attempt any two questions.

[10 × 2=20]

30. Describe the term mole in detail that leads to signify number of information in chemical calculation
 One sodium atom loses one electron from its valence shell and changes into sodium ion as according to the reaction . $\text{Na} - e^- \longrightarrow \text{Na}^+$.
 How many electrons are lost by 1.5 moles of sodium atom to change into Na^+ ions? Also calculate the moles of e^- s lost to obtain 69 gm of Na^+ ions.
 What do you mean by electronegativity? Discuss the variation of E.N. in a group and in a period. 4+3+3
31. Describe the manufacture of nitric acid by catalytic oxidation of ammonia giving neat and well labeled diagram. How is nitric acid detected in laboratory? Explain the oxidizing character of nitric acid. 6+1+3
32. Write short note (any two) 5+5
- Theories of molecular, nascent and atomic hydrogen
 - Chemistry of oxides
 - Modern periodic table and its advantages
 - Classification of organic compounds

The End



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Group A

Attempt any fifteen questions.

[15× 2=30]

- Write an acid and basic radical present in Ag_2CrO_4 . Why are they called so?
- Explain the quantitative significances of chemical reaction
 $\text{NaHCO}_3 + \text{HCl} \longrightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
- How would you apply modern concept to determine valency of elements present in $\text{CH}_3\text{CH}_2\text{OH}$? Explain.
- Define molar volume of gas at NTP or STP with examples.
- Copper has a density of 8.92 gm/ml . if 1 mole of copper were shaped into a cube, what would be the length of the side of the cube.(at.wt. of cu = 63.5)
- Which one has higher mass and why?
 - 0.5 mole of CO_2 or 16 gm SO_2
 - 2 gm of hydrogen or 6.023×10^{21} molecules of O_2 .
- How would you test the presence of CO_3^{2-} (aq) ion and NO_3^- (aq) ion present in the solution. Give complete test reactions.
- What is meant by periodicity? Explain with electronic configuration.
- Explain why
 - Electron affinity of fluorine is unexpectedly less than that of chlorine.
 - Atomic radii are especially defined in bonding situation.
- Mg^{++} and Na^+ have same number of electrons. Which ion would you expect to have smaller radius? Explain.
- Define atomic hydrogen. Show that nascent hydrogen is more powerful reducing agent than molecular hydrogen.
- Define isotope. Mention important uses of heavy hydrogen.
- Define amphoteric oxides. Show that Fe_3O_4 is compound oxide.

- How ozone layer lie in the stratosphere? Give chemical reaction. Mention the resonance structure of ozone.
- Ammonia gas is dried by passing quick lime but can't be dried over conc. H_2SO_4 , CaCl_2 and P_2O_5 . Explain.
- How does ammonia reacts with active heated molten metals? Write two reactions.
- Distinguish between
 - Minerals and Ores
 - Alloys and Amalgams
- Define ferrous and non ferrous alloys. Discuss the reasons of alloying metals.
- What is functional group? Write the functional group of (a) alcohol (b) ester.
- What is homologous series? Explain with example.
- Give the first experimental evidence to reject the vital force theory.
- How can you differentiate between organic and inorganic compounds on the basis of (a) composition (b) nature

Group B

Attempt any five questions.

[5× 5= 25]

- Describe the different types of chemical reaction with necessary example of each. Balance the reaction by partial equation method. 4+1
 $\text{Cl}_2 + \text{cold (dil) NaOH} \longrightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$
- Calculate,
 - How many moles of CO are left when 2×10^{22} molecules are removed from a vessel containing 280 gm of CO?
 - 8 gm of a gas at NTP occupies 2.81 ltr. What is the molecular mass of the gas?
 - The mass of sodium carbonate having the same number of oxygen molecules present in 44.8 ltr of CO_2 at NTP? 2+1+2
- Define ionization energy and electron affinity. Explain the variation of I.E. and E. A along a group and across a period with example. 2+3
- What are oxides? Classify the following oxides giving necessary chemical explanation 5
 - N_2O
 - PbO_2
 - BaO_2
 - SO_3
 - ZnO

27. What happens when explain 5
- Ammonia solution is passed through Ag^+ (I) chloride dropwise till excess
 - Ammonia is passed through excess chlorine gas
 - Liquid Ammonia is passed through Fe^{+++} (aq) solution
 - NO_2 gas is passed over excess moist oxygen gas at 50 atm and 75°C
 - Conc nitric acid is treated with sodium sulphite solution
28. Describe the manufactured of ammonia by Haber's process. Why ammonia is highly soluble in water? 4+1
29. The number of organic compounds are far more greater than inorganic compounds. Explain with suitable examples. 5

Group C

Attempt any two questions. [10 × 2=20]

30. Describe the term mole in detail that leads to signify number of information in chemical calculation
- One magnesium atom loses two electron from its valence shell and changes into magnesium ion as according to the reaction .
 $\text{Mg} - 2e^- \longrightarrow \text{Mg}^{++}$. How many electrons are lost by 1.5 moles of magnesium atom to change into Mg^{++} ions? Also calculate the moles of e^- s lost to obtain 48 gm of Mg^{++} ions.
- What do you mean by electronegativity? Discuss the variation of E.N. in a group and in a period. 4+3+3
31. Describe the manufacture of nitric acid by catalytic oxidation of ammonia giving neat and well labeled diagram. How is nitric acid detected in laboratory? Explain the oxidizing character of nitric acid. 6+1+3
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