1st year Chemistry Guess paper

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Important Short Questions

Chapter# 1

1. How N_2 and CO have same number of electrons, protons and neutrons?
2. No individual neon atom in the sample of the element has a mass of 20.18 amu. Justify.
3. Atomic masses are in fractions. Justify.
4. How limiting reactant controls the amount of product formed?
5. 32 g of O_2 28 g of N_2 and 16 g of CH_4 have different masses but same volume. Why?
6. Why actual yield is always lesser than theoretical yield?
7. Law of conservation of mass has to be obeyed during stoichiometric calculations. Explain.
8. One mole of H_2SO_4 should completely react with two moles of NaOH. How does Avogadro's Number helps us too explain it.
9. Calculate the mass of 5.136 moles Ag_2CO_3.
10. What are molecular ions. How they are formed. Give their applications.
11. How the efficiency of a chemical reaction is determined?

Chapter # 2

12. Why NaCl cannot be purified by crystallization?
13. How crystals are dried? Vacuum Desiccator is safe and reliable method of drying the crystals.
14. How coloured impurities are removed from crystals during crystallization.
15. Give uses of chromatography.
16. Differentiate between adsorption and partition chromatography.
17. Define 'Sublimation' with an example.
18. Why concentrated HCl and $KMnO_4$ cannot be filtered by Gooch crucible?
19. Repeated extractions using small portions of solvent are more efficient than using a single extraction. Why?

Chapter # 3

20. Gases behave ideally at low pressure and high temperature. Explain.
21. Calculate value of 'R' SI units.
22. Water vapours do not behave at 273K. Why?

23. What is the significance of Van der Waals constants?
24. Differentiate between diffusion and effusion.
25. Do you think that some of the postulates of kinetic molecular theory are faulty? Point out these postulates.
26. Differentiate between natural and artificial plasma.
27. How plasma is formed?
28. Explain the application of Dalton's Law in respiration.

Chapter # 4

29. Why there is a big difference in the physical states of halogens as we move from fluorine to iodine?
30. Food is cooked quickly in pressure cooker. Why?
31. Why one feel sense of cooling under the fan after bath?
32. Boiling needs a constant supply of heat. Explain.
33. Diamond is hard and electrical insulator. Explain.
34. Why Graphite is conductor parallel to its layers not perpendicular?
35. Cleavage itself is an isotropic property. How?
36. Why ionic crystals are highly brittle?

Chapter # 5

37. Why positive rays are also called 'Canal rays'.
38. How do you come to know that velocities of electrons in orbits closer to the nucleus are higher than those in higher orbits?
39. Differentiate between atomic emission and atomic absorption spectrum.
40. What is 'Zeeman effect'?
41. What is stark effect
42. Why the e/m value of cathode rays is just equal to electrons?
43. State Pauli's exclusion principle.
44. Differentiate between atomic emission and atomic absorption spectrum.
45. Differentiate between continuous spectrum and line spectrum.
46. Justify that distance gaps between different orbits go on increasing from the lower to higher orbits.
47. Write two properties of neutrons.

Chapter # 6

48. Bond distance is the compromise distance between two atoms. Justify.
49. Why 2nd ionization energy is always greater than first ionization energy.
50. No Bond in chemistry is 100% ionic.
51. Why the energy of bonding molecular orbitals is lesser than anti-bonding molecular orbitals?
52. Ionic bonds are non-directional. Justify.
53. Define dipole moment.
54. What is the limitation of VSEPR theory.
55. The ionization energy of group II-A is higher than group III-A. Why?

56. Why oxygen is paramagnetic in nature?
57. Sigma bond is stronger than pi bond. Explain.
58. Pi-bonds are more diffused than sigma bonds. Explain.
59. Define dipole moment.
60. The dipole moment of CO_2 and CS_2 are zero, but that of SO_2 is 1.61 D. Why?

Chapter # 7

61. Explain that burning of candle is spontaneous process.
62. Define enthalpy of neutralization with an example.
63. State first law of thermodynamics.
64. Volume is a state function. Justify.
65. Define enthalpy of atomization with an example.
66. Define enthalpy of solution.
67. Differentiate between spontaneous and non-spontaneous reactions.
68. State Born Haber Cycle.

Chapter # 8

69. The solubility of glucose in water is increased by increasing temperature. Explain.
70. How the direction of reaction is predicted by equilibrium constant.
71. Define pH and pOH.
72. What is ionic product of water.
73. Solubilities are depressed by the addition of common ions.
74. State Le-Chatelier's Principle.
75. What is solubility product? What is solubility product expression for $PbCl_2$.
76. Define buffer capacity.
77. High pressure favours the reaction in which there is decrease in volume (reactants to products)
78. What are acidic buffers? Give an example.

Chapter # 9

79. One molal solution is more dilute than one molar solution. Justify.
80. Define parts per million.
81. The sum of mole fractions of all components is unity. Justify.
82. Why the vapor pressure of solution is less than that of pure solvent?
83. State Raoult's Law.
84. NaCl and KCl are used to lower the melting point of ice. Justify.
85. Molality is independent of temperature but molarity depends on temperature. Why?
86. What are Zeotropes? Give example.
87. Define the Colligative properties. Name any two Colligative properties.
88. Beckmann's thermometer is used to note the depression in freezing point. Why?

Chapter # 10

89. What is the function of salt bride in voltaic cell?
90. How sodium metal is prepared by Down's cell?
91. Calculate the oxidation number of chromium

(a) $CrCl_3$ (b) $K_2Cr_2O_7$

92. How impure copper can be purified by electrolysis.
93. A salt bridge maintains the electrical neutrality. Explain. /What is the function of salt bride in voltaic cell?
94. How electrochemical series can help us to determine whether a reaction is feasible or not?
95. Na and K can displace hydrogen from acids but Pt, Pd and Cu cannot. Why?
96. Lead accumulator is rechargeable. Justify.
97. Write down the reactions happening in fuel cell.
98. Write down the advantages of fuel cell over other batteries.

Chapter # 11

99. Define reaction kinetics.
100. Rate of a reaction is an ever-changing parameter. Justify
101. The radioactive decay is always first order reaction. Justify.
102. Photochemical reactions are usually zero order reactions. Justify.
103. How half-life of a chemical reaction is related with initial concentration of reactants.
104. How order is determined by the method of large excess?
105. How surface area affects the rate of a chemical reaction. Give one example.
106. How rate is affected by light?
107. Differentiate between homogeneous and heterogeneous catalysis.
108. A catalyst does not affect the equilibrium constant. Justify.
109. A catalyst is specific in nature justify.
110. Define catalytic poisoning.
111. What is negative catalyst? Give example.
112. What is auto-catalyst. Give example.
113. Give two characteristics of enzyme catalysis.

Important Long Questions

1. What is Dalton's law of partial pressure? Also discuss its application.

2. One mole of methane is maintained at 300 K . Its volume is 250 cm3 . Calculate the pressure exerted by the gas when it considered as an ideal gas?

3. Calculate the mass of 1 dm3 of NH3 gas at 30 oC and 100 mm/Hg pressure, considering the NH3 is behaving ideally?

4. Give eight postulates of kinetic molecular theory.

5. What is H-bonding? Discuss H-bonding in biological compounds.

6. How does the hydrogen bonding explain the formation of ice lesser density than liquid water.

7. Define liquid crystals. Discuss important uses of liquid crystal.

8. Write down the properties of ionic solids.

9. Explain Rutherford's model of atom. Give its defects.

10. Define Quantum numbers. Discuss briefly Azimuthal Quantum number.

11. Give the different postulates of Bohr's atomic model.

12. Write down the main postulates of valence shell electron pair repulsion theory and discuss the structure of NH_3 with reference of this theory.

13. Briefly explain shapes of NH_3 and H_2O molecule according to hybridizing theory.

14. Why bond formation is not possible between two He atoms? Prove with molecular orbital theory.

`15. Describe bomb Calorimeter

16. Define and explain Hess's law of constant heat summation with examples.

17. Define the following terms: Molality, Mole fraction and part per million.

18. What is Raoul's law? Give its three statements.

19. Describe one method to determine the boiling point of elevation of solutes.

20. State rules for assigning oxidation number of elements with examples.

21. Write construction and working of voltaic cell.

22. Describe the electrolysis of molten sodium chloride and a concentrated solution of sodium chloride.

23. Give four industrial importance of electrolysis process in detail.

24. What is electrochemical series? Give its four applications?

25. How light and surface are affect the rate of reaction.

26. Write four characteristics of a catalyst.

27. How does Arrhenius equation help us to calculate the energy of activation of reaction?

28. Define Half-Life period and order of reaction. Describe half-life method to determine the order or reaction.

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