

GOVIND VIDYALAYA, TAMULIA

CHEMISTRY (SET- I)

SAMPLE PAPER OF 1ST TERM (2015-16)

STD. XI

TIME :3:00HRS.

F.M.- 70

Q.No.1 to 4 carry one marks each

Q.No.5 to 11 carries two marks each

Q.No.12 to 22 carries three marks each

Q.No.23 carry 4 marks.

Q.No.24 to 26 carries five marks each.

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- 1) What are isotones?
 - 2) What is the basic theme of organization in the periodic table?
 - 3) Which out of NH_3 and NF_3 has higher dipole moment and why?
 - 4) What property of molecules of real gases is indicated by vanderwaal constant 'a'?
 - 5) Why energy levels are also known as stationery states
 - 6) All transition elements are d-block elements but all d-block elements are not transition metals.explain
 - 7) Why liquids like ether and acetone kept in cool places?
 - 8) Explain why PCl_5 is trigonalbipyramidal whereas IF_5 is square pyramidal?
 - 9) Calculate the mass of sodium acetate(CH_3COONa)required to make 500 ml of 0.375 molar aqueous solution. Molar mass of sodium acetate is $82.0245 \text{ g mol}^{-1}$.
 - 10) How much copper can be obtained from 100 g of copper sulphate (CuSO_4 (Atomic mass of Cu=63.5u)
 - 11) What is the total number of orbitals associated with the principle quantum number $n=3$.
 - 12) Calculate the mass percentage of different elements present in sodium sulphate ($\text{Na}_2 \text{So}_4$).
 - 13) Draw the MOT diagram of N_2 , O_2 .
 - 14) Calculate the wave number for the longer wavelength transition in the Balmer series of atomic hydrogen.
 - 15) A certain particle carries $2.5 \times 10^{-16} \text{ C}$ of static electric charge calculate the number of electrons present in it.
 - 16) Nitrogen has positive electron gain enthalpy whereas oxygen has negative .However oxygen has lower ionization enthalpy than nitrogen. Explain.
 - 17) What are the major differences between metals and non-metals.
 - 18) Although geometries of NH_3 and H_2O molecules are distorted tetrahedral , bond angle in water is less than that of ammonia. Discuss.
 - 19) Explain the important aspects of resonance with reference to the CO_3^{2-} ion.
 - 20) Explain the formation of H_2 molecule on the basis of VBT?
 - 21) 2.9 g of gas at 95°C occupied the same volume as 0.184 g of dihydrogen at 17°C at the same pressure. What is the molar mass of the gas?

- 22) A mixture of dihydrogen and dioxygen at 1 bar pressure contains 20% by weight of dihydrogen. Calculate the partial pressure of dihydrogen.
- 23) You all have friends .There are very few people who want to remain alone . Freinds share their views ,play and eat together and sometimes help each other in overcoming difficulties of life. True friends help you to achieve success. The force of attraction between friends is similar to the force of attraction between atoms forming chemical bonds.
- Why do we make friends and atoms make chemical bonds?
 - What holds friends together and atoms in a molecule?
 - What values are possessed by people who make friends easily?
 - Are those children happy, who remain alone. Give reason.
 - What will you do if you have difference in opinion with your friends.
 - What type of covalent bond are formed by atoms having difference in electronegativity?
- 24) Define hybridization. Explain the structure of C_2H_2 with orbital diagram.
- 25) State boyle's law, Charles law and avogadros law .use these laws to derive the equation of state for ideal gas i.e. $PV=NRT$.
- 26) What are various postulaes of bohr's model of atom. How could bohr's model explain the existence of so many lines in the spectrum of hydrogen. What are the drawbacks of bohr's model?

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GOVIND VIDYALAYA, TAMULIA
CHEMISTRY (SET- II)
SAMPLE PAPER OF 1ST TERM (2015-16)
STD. XI

TIME :3:00HRS.

F.M.- 70

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Q.No.12 to 22 carries three marks each

Q.No.23 carry 4 marks.

Q.No.24 to 26 carries five marks each.

- What is the value of e/m for the particles in cathode rays.
- Explain, why halogens act as a good oxidizing agent?
- Give resonating structures of CO_3^{2-} ion.
- Falling liquid drops is spherical. Why?
- Define precision and accuracy.
- What is the difference between a photon and a quantum?
- Explain the formation of hydrogen molecules on basis of valence bond theory.
- What is aqueous tension? Is it always necessary to subtract aqueous tension from the observed pressure while dealing with gas equation? Justify.
- Calculate the molecular mass of the following:
i) H_2O ii) CO_2 iii) CH_4
- Calculate the mass percentage of different elements present in sodium sulphate (Na_2SO_4)

- 11) In three moles of ethane (C₂H₆), calculate the following:
 - i) Number of moles of carbon atom
 - ii) Number of moles of hydrogen atom
 - iii) Number of molecules of ethane
- 12) Calculate the molarity of a solution of ethanol in water in which the mole fraction of ethanol is 0.040.
- 13) Define hybridization. What is the hybridization of PCl₅, BF₃ & NH₃.
- 14) What is the total number of orbitals associated with the principle quantum number n=3.
- 15) Emission transitions in the Paschen series end at orbit n=3 and start from orbit n and can be represented as $\nu = 3.29 \times 10^{15} (\text{Hz}) [1/3^2 - 1/n^2]$
- 16) What are quantum numbers?
- 17) Explain the term successive ionization enthalpies
- 18) Discuss the variation of electropositive character in a group and in a Period.
- 19) Making use of the concept of hybridization discuss the shapes of:
 - i) BeCl₂
 - ii) BF₃
 - iii) CH₄ molecules
- 20) What are intermolecular and intramolecular H-bonds? Give examples.
- 21) Give three points of difference between the three states of matter on the basis of particle model.
- 22) Explain the following:
 - i) Glycerine is more viscous than water
 - ii) ethylene glycol has greater density than ethyle alcohol.
 - iii) Evaporation causes cooling.
- 23) In class XI, Ritesh has friendship with Ankit similar kind of student, that is, both of them are good sportsmen and fond of studies. They equally share their skills with each other and remain happy in other's company.
 - i) Compare this type of friendship with type chemical bond.
 - ii) Should we make friends with students who bunk classes? Give reason.
 - iii) Why do people having similar taste make friendship?
- 24) Write outer electronic configuration of Cr atom. Why bare half filled orbitals more stable?
- 25) (i) What are two conditions for the formation of hydrogen bond?
 (ii) In which of the following compounds 'S' does not obey octet rule?
 SF₂, SF₄, SF₆, SO₂
 (iii) Explain the formation of a chemical bond
- 26) How molecular orbital different from atomic orbital? Give electronic configuration of (i) H₂⁺ (ii) Li₂ (iii) B₂

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GOVIND VIDYALAYA, TAMULIA

CHEMISTRY (SET- III)

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STD. XI

TIME :3:00HRS.

F.M.- 70

Q.No.1 to 4 carry one marks each

Q.No.5 to 11 carries two marks each

Q.No.12 to 22 carries three marks each

Q.No.23 carry 4 marks.

Q.No.24 to 26 carries five marks each.

- 1) Which out of NH₃ and NF₃ has higher dipole moment and why?
- 2) What is the basic theme of organization in the periodic table?
- 3) What are isotones?
- 4) How many gram molecules of hydrogen are present 20g of hydrogen ?
- 5) How much copper can be obtained from 100 g of copper sulphate (CuSO₄ (Atomic mass of Cu=63.5u)
- 6) Calculate the mass of sodium acetate(CH₃COONa)required to make 500 ml of 0.375 molar aqueous solution.
Molar mass of sodium acetate is 82.0245 g mol
- 7) Explain why PCl₅ is trigonalbipyramidal whereas IF₅ is square pyramidal?
- 8) Why liquids like ether and acetone kept in cool places?
- 9) All transition elements are d-block elements but all d-block elements are not transition metals. Explain
- 10) Why energy levels are also known as stationery states?

- 11) How would you separate the following mixtures?
 - i) Salt and water
 - ii) Glass powder, iron filings and sugar
- 12) Determine the molecular formula of an oxide of iron in which the mass percentage of iron and oxygen are 69.9 and 30.1 respectively.
- 13) Which out of NH_3 and NF_3 has higher dipole moment and why?
- 14) A mixture of dihydrogen and dioxygen at 1 bar pressure contains 20% by weight of dihydrogen. Calculate the partial pressure of dihydrogen.
- 15) 2.9 g of gas at 95°C occupied the same volume as 0.184 g of dihydrogen at 17°C at the same pressure. What is the molar mass of the gas?
- 16) Explain the formation of H_2 molecule on the basis of VBT?
- 17) Explain the important aspects of resonance with reference to the CO_3^{2-} ion.
- 18) Although geometries of NH_3 and H_2O molecules are distorted tetrahedral, bond angle in water is less than that of ammonia. Discuss.
- 19) What are the major differences between metals and non-metals.
- 20) Nitrogen has positive electron gain enthalpy whereas oxygen has negative. However oxygen has lower ionization enthalpy than nitrogen. Explain.
- 21) A certain particle carries 2.5×10^{-16} C of static electric charge calculate the number of electrons present in it.
- 22) Calculate the wave number for the longer wavelength transition in the Balmer series of atomic hydrogen.
- 23) You all have friends. There are very few people who want to remain alone. Friends share their views, play and eat together and sometimes help each other in overcoming difficulties of life. True friends help you to achieve success. The force of attraction between friends is similar to the force of attraction between atoms forming chemical bonds.
 - i) Why do we make friends and atoms make chemical bonds?
 - ii) What holds friends together and atoms in a molecule?
 - iii) What values are possessed by people who make friends easily?
 - iv) Are those children happy, who remain alone. Give reason.
 - v) What will you do if you have difference in opinion with your friends.
 - vi) What type of covalent bond are formed by atoms having difference in electro negativity?
- 24) What are various postulates of Bohr's model of atom. How could Bohr's model explain the existence of so many lines in the spectrum of hydrogen. What are the drawbacks of Bohr's model?
- 25) State Boyle's law, Charles law and Avogadro's law. Use these laws to derive the equation of state for ideal gas i.e. $PV = nRt$.
- 26) Define hybridization. Explain the structure of SF_6 with orbital diagram.

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GOVIND VIDYALAYA, TAMULIA

CHEMISTRY (SET- IV)

SAMPLE PAPER OF 1ST TERM (2015-16)

STD. XI

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F.M.- 70

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 Q.No.24 to 26 carries five marks each.

- 1) Liquid ammonia bottle is cooled before opening the seal. Why?
- 2) Write resonance structure of SO_3 ?
- 3) What are the possible values of m for an electron in 3d sub shell?
- 4) What is the value gram molecular volume at S.T.P.?
- 5) Calculate the amount of water (g) produced by the combustion of 16g of methane?
- 6) Calculate the mass percent of different elements present in sodium sulphate (Na_2SO_4)?
- 7) How much time will it take to distribute 1 Avogadro number of wheat grains if 10^{10} grains are distributed each second?

- 8) Give two differences between σ and π bonds.
- 9) Out of O and S which has higher negative electron gain enthalpy and why?
- 10) What do you mean by Heisenberg's uncertainty principle? Give the significance of ψ
- 11) State and explain the law of multiple proportions?
- 12) Draw the MOT diagram of N_2 , O_2 .
- 13) Calculate the molarity of a solution of ethanol in water in which the mole fraction of ethanol is 0.040.
- 14) Density of a gas is found to be 5.46 g/dm^3 at 27°C at 2 bar pressure. What will be its density at STP?
- 15) What do you mean by ideal gas and real gas? Why do real gases deviate from ideal behavior?
Derive van der Waal's equations for real gases?
- 16) How can one non-polar molecule induce a dipole in nearby non-polar molecule?
- 17) Draw the molecular structures of :
i) XeF_2 ii) $XeOF_2$ iii) XeF_4
- 18) Which out of NH_3 and NF_3 has higher dipole moment and why?
- 19) What is meant by hybridization of atomic orbitals. Describe the shapes of sp, sp^2, sp^3 hybrid orbitals?
- 20) i) Arrange the following ions in the order of their increasing ionic radii: $Na^+, Mg^{2+}, F^-, O^{2-}$
ii) Explain why Be has higher ionization enthalpy than B.
iii) Predict the formula of compound which might be formed by silicon and bromine.
- 21) i) Arrange the following ions in the order of their increasing ionic radii: $Na^+, Mg^{2+}, F^-, O^{2-}$
ii) Explain why Be has higher ionization enthalpy than B.
iii) Predict the formula of compound which might be formed by silicon and bromine.
- 22) The unpaired electrons in Al and Si are present in 3p orbital. Which electrons will experience more effective nuclear charge from the nucleus?
- 23) Sodium and potassium lose electrons easily and form ionic bonds with non-metals like chlorine, fluorine which gain electrons. They form ionic bonds which are strong bonds. Rahul Sharma an intelligent student of class 12 has friends Amit and Krishankumar who are weak students. Rahul Sharma follows the lesson taught in class easily whereas Amit and Krishankumar do not follow easily. Rahul helps Amit and Krishankumar to understand the concepts and in turn they are thankful to him. Their friendship is long lasting because both are happy. Rahul feels a sense of achievement.
- i) Should intelligent students make friends with weak students? Give reason.
- ii) Which type of bonds will be formed if you compare it with this kind of friendship? Justify.
- iii) Why are ionic bonds and friendship of such students strong?
- 24) Using the equation of state $PV=nRT$ show that at given temperature the density of the gas is proportional to the gas pressure P.
- 25) Give various important postulates of VSEPR theory, apply these postulates to describe the difference in shapes of polyvalent species SF_4, CF_4 and XeF_4 .
- 26) Why is +2 o.s. of Mn(25) quite stable, while the same is not true for iron(26)?
- ii) What is meant by dual nature of electrons? Calculate the energy and wavelength of photon emitted by hydrogen atom when electron makes a transition from $n=2$ to $n=1$. Given that the ionization potential is 13.6 eV ($1\text{eV}=1.6 \times 10^{-19}\text{J}$)

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- 1) Define :
 - i) bond length
 - ii) bond enthalpy
 - 2) Why do noble gases have bigger atomic size than halogens?
 - 3) What is the shape of 3s orbital? How many nodes are there in it.
 - 4) What is the semi molar solution of NaOH?
 - 5) What is the mass(mg) of a zinc block whose dimensions are 2.0''*3.0''*5.0'' and whose density is 2.5 gm per cm³. Given 1.0''=2.54cm
 - 6) If the density of methanol is 0.793kg L⁻¹, what is its volume needed for making 2.5L of its 0.25 M solution?
 - 7) Boiling point of water(373) is higher than H₂S(221.2). Why?
 - 8) Why is BeCl₂ linear whereas SnCl₂ angular molecule?
 - 9) Write the general outer electronic configuration of s, p, d and f- block elements?
 - 10) Compare the mass and charge of the three fundamental sub atomic particles.
 - 11) Why do we use the terms average and relative in the definition of atomic mass.
 - 12) Define hybridization. What is the hybridization of PCl₅, BF₃ & NH₃.
 - 13) Calculate the mass percentage of different elements present in sodium sulphate (Na₂ SO₄).
 - 14) How is VB theory different from lewis concept in regard to the formation of covalent bond?
 - 15) Draw diagrams showing the formation of a double bond and triple bond between carbon atoms in C₂H₂ and C₂H₄ molecules?
 - 16) What do you understand by bond pairs and lone pairs of electrons? Illustrate by giving the examples of each type?
 - 17) How is the bonding molecular orbital in a molecule of hydrogen different from its anti-bonding molecular orbital?
 - 18) Give two resonating structures of ozone which satisfy octet rule? Also give the probable hybrid structure?
 - 19) Elements with Z=107 and Z=109 have been isolated but the one with Z=108 has not been isolated. Indicate the groups in which they will find place in the periodic table
 - 20) Describe the main characteristics properties of s,p,d and f block elements?
 - 21) In Milikan's experiment, static electric charge on oil drops has been obtained by shining X-rays. If the static electric charge on the oil drop is $-1.282 \times 10^{-18} \text{C}$, calculate the number of electrons present on it
 - 22) The longest wavelength doublet absorption transition is observed at 589.6nm. Calculate the frequency of each transition and the energy difference between the two excited states.
 - 23) Mukesh has height smaller than other children and feels inferiority complex. Other children having good height try to dominate over Mukesh. Similarly Akshay is thin or lean whereas Hemant is obese (overweight) Hemant keeps on thinking about weight loss but does not take part in exercise and do not take balanced diet.
 - i) Should we care about our height? Give reason?
 - ii) What will you do if you are overweight?
 - iii) Are tall and lean people better than short and overweight people?
 - iv) Why do atoms have different chemical properties?
 - 24) What is the effect of temperature on the following:
 - i) Viscosity
 - ii) Vaporisation
 - iii) Surface tension
 - iv) Vapour pressure
 - 25) What does LCAO stand for? Name the theory which adopts this method for explaining the bonding? Give important assumptions of this theory.
 - 26) Write down electronic configuration of Fe³⁺ ion and the following:
 - i) What is the number of unpaired electrons in it?
 - ii) How many electrons in it have n=3 and m=0?
 - iii) How many electrons in it have l=1?
 - iv) What is the number of electrons in M-shell?

GOVIND VIDYALAYA, TAMULIA

CHEMISTRY (SET- VI)

SAMPLE PAPER OF 1ST TERM (2015-16)

STD. XI

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F.M.- 70

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Q.No.24 to 26 carries five marks each.

- 1) Draw the lewis structure of $\text{SiCl}_4, \text{HCOOH}$?
- 2) State modern periodic law?
- 3) What is the number of d electrons in Cr^{3+} ion.
- 4) What is molecular mass of heavy water?
- 5) Give two differences between σ and π bonds.
- 6) How is the empirical formula of a compound related to its molecular formula?
- 7) Can a gas with $a=0$ is liquefied?
- 8) What do you understand by the term chemical bonds? Name various types of bonds .
- 9) Why $\Delta_f H_f$ of : i) ${}_{7}\text{N}$ is greater than ${}_{8}\text{O}$.
ii) ${}_{13}\text{Al}$ is less than ${}_{12}\text{Mg}$
- 10) What are quantum numbers?
- 11) Define molarity? What are its units? What is the effect of temperature on molarity of a solution?
- 12) Determine the molecular formula of an oxide of iron in which the mass percentage of iron and oxygen are 69.9 and 30.1 respectively.
- 13) Define hybridization. What is the hybridization of $\text{PCl}_5, \text{BF}_3$ & NH_3 .
- 14) At the density of a gaseous oxide at 2 bar is same as that of nitrogen at 5 bar. What is the molecular mass of the oxide? $^{\circ}\text{C}$
- 15) What will be the minimum pressure required to compress 500dm³ of air at 1 bar to 200 dm³ at 30 $^{\circ}\text{C}$?
- 16) Use MOT to explain why Be_2 molecule does not exist?
- 17) If electro negativities of H and F are given to be 2.1 and 4.0 resp. what is the % ionic character in H-F bond on the basis of Hannay smith equation?
- 18) Explain the shape of CF_4 molecule on the basis of hybridization?
- 19) Show by a chemical reaction with water that Na_2O is basic oxide and Cl_2O_7 is an acidic oxide?
- 20) How much energy in KJ is produced when 7.1g of chlorine in the form of Cl atoms is converted to Cl^- ions in gaseous state? Electron gain enthalpy of chlorine is -3.7 eV?
- 21) State hund's rule of maximum multiplicity. How is it used in electronic distribution in nitrogen atom($Z=7$)?
- 22) Write short notes on :
i) Aufbau principle
ii)magnetic quantum number
- 23) If you want to know your qualities a single person cannot tell all of your qualities even some of your qualities you may not be aware .Your friends, teachers, relatives, siblings will be able to tell some of your qualities but no one can tell all of your qualities. Similar in chemistry there are some compounds whose all the properties cannot be explained by single structure. More than one structure which explain the properties of compound are called resonating structure. This phenomena is called a resonance.
i)Name the phenomenon which resembles this situation.
ii) Which of your qualities are appreciated by your friends?
iii) Which of your values are liked by your parents and teachers?
iv) Which of your qualities are not liked by anybody?
v) How much important is attitude in getting success?
vi) What is the importance of resonance in chemistry?

- 24) A student forgot to add the reaction mixture to the round bottomed flask at 27°C but put it on the flame. After a lapse of time he realized his mistake. By using a pyrometer he found that the temperature of the flask was 477°C . What fraction of air would have been expelled out?
- 25) Discuss the formation of covalent bond and co-ordinate bond on the basis of lewis concept as well as by orbital overlap concept? Give suitable examples?
- 26) a) What is photoelectric effect? Explain how wave theory could not explain observations of photoelectric effect. Explain photoelectric effect on the basis of planck's quantum theory.
b) Calculate frequency and wave number of a radiation having wavelength 500nm.

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