CHEMISTRY

BOOKS - JEEVITH PUBLICATIONS CHEMISTRY (KANNADA ENGLISH)

SUPER MODEL QUESTION PAPER (FOR PRACTICE)

Part A

1. Define relative atomic mass of a element.

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2. Mention the value of charge on an electron.

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3. What is the basis of modern periodic table?

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4. State Charles' law.

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5. For an isolated system $\Delta U = 0$ What is ΔS?

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6. What is an Electrolyte?

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7. What is the formula of calogen?

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8. Name the three isotopes of hydrogen.

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9. What happens when sodium metal is dropped in water?

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10. Define a functional group?

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11. Which isomers among cis and trans have highest boiling point?

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12. Which is the radioactive isotope of hydrogen?

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13. What is chain isomerism?

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14. What is the SI unit of electric current?

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15. Which halogen has highest electron affinity or electron gain enthalpy ?

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16. Define σ- bond.

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17. State Boyle's law.

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18. Name the green house gases.

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19. How is quick lime prepared?

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20. Define standard enthalpy of formation .

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21. Explain Werner Heisenberg's uncertainty principle (qualitative).

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22. What is the conjugate acid of H_2O?

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1. Electromagnetic Radiation of wavelength 242 nm is just sufficient to ionize the sodium atom. Calculate the ionization energy sodium in kJ mol^{-1}.

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2. What is screening effect? How does it influcence the ionization enthalpy?

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3. Define hydrogen bond. Is it weaker or stronger than the vander waal's for as?

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4. What is compressibility factor? The compressibility factor for a

gas less than1. What does it show?

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5. Consider the reaction of water with F_2 and suggest in terms of

oxidation and reduction which species are oxidized /reduced?

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6. Write the structure of diamond.

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7. Discuss the harmfull effects of acid rain.

8. How many significant figures are present in the following (a) 8.2015 b. 3.10087?

9. What is heavy water? Mention its use.

10. How does ionizatioin enthalpy vary along a period? Give reason.

11. What happens when aluminium is a. heated strongly in air b. reacted with chlorine.

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12. Write the resonance structure of CO_3^{2-}

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13. How can photochemical smog be controlled?

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14. Certain amount of a gas occupies a volume of 400 ml at $17°C$, To what temperature should it be heated so that its volume gets doubled?

Part C

1. A compound contains

$K = 42.3913 \ \% \ , Fe = 15.2173 \ \% \ , C = 19.5652 \ \% \ , N = 22.8260 \ \%$

. Find the empirical formula of the compound.

2. Distinguish between a sigma and a pi bond.

3. Define bond length

4. The equilibrium constant for the reaction is 10. Calculate the value of ΔG°, Given $R = 8.314 JK^{-1}mol^{-1} T = 300K$

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5. What are spontaneous and non-spontaneous changes?

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6. Balance the following equation in basic medium by oxidation number method and identy the oxidizing agent ant the reducing agent.

$$N_2H_4(1) + ClO_3^-(aq) \rightarrow NO(g) + Cl^-(g)$$
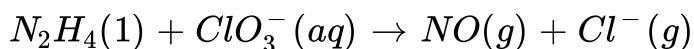
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7. Oxidation cannot occur without reduction justify.

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8. Classify the following reagents as nucleophiles and elecrtrophiles

NC^- (ii) CH_3COO^+

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9. Write the various resonating structures of $CH_3CH = CH\overset{\oplus}{C}H_2$

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10. Write the structures for the following compounds.
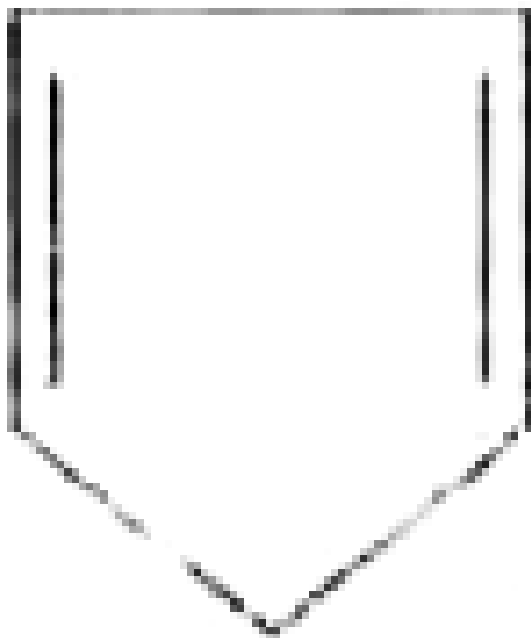
(i) 2,2 dimethylpentane (ii) But-3-yn-lol

11. What is the difference between distillation under reduced pressure and steam distillation.

12. Explain why the following system is not aromatic?

13. How will you convert benzene into p-chloronitrobenzene?

14. Write the significance of four quantum numbers.

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15. Calculate the wave number of the spectral line of shortest wavelength appearing in the Balmer series of H-spectrum. $\left(R = 1.09 \times 10^7 m^{-1}\right)$

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16. Draw the structure of p-orbitals (Draw the shape of orbital whose Azimuthal quantum no is 1).

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17. Mention two conditions for an atom to form an ionic bond.

18. Write the electron dot structure of the following : O_2 and O_3

19. Calculate the maximum work obtained when 0.75 mole of an ideal gas expands isothermally and reversibley at $27°C$ from a volume of 15L to 25 L.
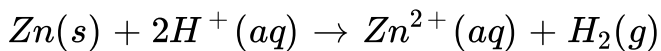
20. What is entropy? What is the value of entropy of a perfectly crystalline substance at absolute zero?

21. Identify the oxidant and reductant in the following reaction:

$$Zn(s) + 2H^+(aq) \rightarrow Zn^{2+}(aq) + H_2(g)$$

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22. State Markowniff's rule with an example.

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23. Write the structure of cis and trans isomer of But-2-ene.

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24. Explain distillation method of purification of organic compounds.

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1. Rutherfords atomic model accounts for :

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2. What is isotopes?

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3. Distinguish between a sigma and a pi bond.

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4. Predict the shapes of the following molecules using the VSEPR model (i) $BeCl_2$ (ii) PH_3

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5. Define standard enthalpy of formation .

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6. The ionization constant of benzoic acid is 6.46×10^{-5} and K_{sp} for silver benzol is 2.5×10^{-13}. How many times is silver benzoate more soluble in a buffer of pH is 3.19 compared to its solubility in pure water?

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7. Calculate the pH of the solution formed when 2g of TlOH dissolved in water to give 2 liter of solution.

8. For the following equation $K_c = 6.3 \times 10^{14}$ at 1000L.

$NO(g) + O_3(g) \rightarrow NO_2(g) + O_2(g)$. What is K_c for the reverse reaction?

9. Define Le-Chatelier's principle.

10. What is common ion effect? Give an example.

11. Explain the structure of diborane molecule.

12. Why does BF_3 behaves as Lewis acid?

13. Write the principles for the estimation of nitrogen by Kjeldahl's method.

14. What are carbonions? How are they formed?

15. A plastic jug contains 3.5 liters of milk. Calculate the volume of milk is meter^3

16. How many moles of methane is required to produce 88 g of CO_2 after combustion.

17. Define empirical formula.

18. State the three postulates of Bohr's theory of hydrogen atom.

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19. State Pauli's exclusion principle. Give the possible values of l for $n = 2$

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20. State Dalton's law of partial presuures.

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21. Hydrogen gas at room temperature occupies a volume of 4.47 litres at 1 bar pressure if the pressure exceeds 0.6 bar what is the volume occupied by the hydrogen gas.

22. Write ideal gas equation for one mole of gas.

23. Calculate the solubility of $PbSO_4$ where solubility is 4.6×10^{-14}.

24. Calculate the pH of 1 molar sulphuric acid.

25. What are Lewis acid?

26. Define Le-Chatelier's principle.

27. Calculate the equilibrium cosntant (K_c) for formation of ammonia from nitrogen and hydrogen at equilibrium where $[N_2] = 2.1 \times 10^{-2}m, [H_2] = 3.7 \times 10^{-2}m, [NH_3] = 1.7 \times 10^{-2}m$.

28. Write the chemical composition of slaked lime and plaster of paris.

29. Write the equations during the preparation of sodium carbonate by solvay process.

30. Define inductive effect. Give an example for a group which is electron donating.

31. Write a note on distillation?

32. What are electrophiles?
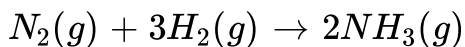
Part E

1. Nitrogen and hydrogen react to form ammonia according to the reaction:

$$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$$

If 1000 g H_2 react with 2000g of N_2

(i) Identify the limiting reagent.

(ii) Calculate the mass of ammonia (NH_3) which will be formed.

2. How many significant figures should be present in the answer of the calculation 5×5.364

3. Write the postulates of kinetic theory of gases.

4. Define vapour pressure.

5. The pH of 0.1 m solution of cyanic acid (HCNO) is 2.34. Calculate ionization constant of the acid and also its degree of dissociation in the solution.

6. The equilibrium constant expressioni for as gas reaction is $K_c = \dfrac{[NH_3]^4[O_2]^5}{[NO]^4[H_2O]^6}$. Write the balanced chemical equation corresponding to this expression.

7. What is aromaticity ? Discuss the conditions under which a compound can be aromatic.

8. Write the functional grop for (i) Aldehyde (ii) Ketone.

9. Explain the formation of $BeCl2$ on the concept of hyridisation.

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10. Define bond order. How is it related to bond length.

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11. Calculate the standard enthaly of formation of Methane. Given that the standard enthalpy of combustion of Methane, carbon and Hydrogen are -893.3kJ, -3.93kJ and -285.8kJ respectively.

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12. State first law of thermodynamics.

13. A solution contains $0.1MH_2$ and 0.3MHCl. Calculate the concentration of S^2 and HS- ions in the solution. For $H_2S, K_{a_1} = 1.05 \times 10^{-7}$ and $K_{a_2} = 1.3 \times 10^{-14}$.

14. What are amphoteric substances? Illustrates with an example.

15. Give equations for the following:

(a) Preparation of CO from HCOOH

(b) Preparation of producer gas

(c) Preparation of water gas.

16. List two similarities between boron and silicon.

17. How are the following conversions carried out.

(i) Ethene to ethane (ii) Propylchloride to propane.