

HALF YEARLY EXAM-2017-18
CLASS XI-A
SUB.: CHEMISTRY

(SET-B)
M.M-70

TIME -3 HRS

All questions are compulsory

- Questions Nos 1 to 5 carry ONE MARK each.
- Question Nos 6 to 10 carry TWO MARKS each.
- Question Nos 11 to 22 carry THREE MARKS each.
- Question No 23 is a value based question and carries FOUR MARKS.
- Question Nos 24 to 26 carry FIVE MARKS each

1 MARK QUESTIONS

1. Write conjugate acid and base NH_3 .
2. Write the electronic configuration of Co^{+3} and find out the number of unpaired electrons present in it. (27)
3. Which quantum numbers originate from Schrodinger wave equation?
4. Predict the entropy change in-
 - (a) A liquid crystallizes into solid
 - (b) Temperature of a crystallize solid raised from OK to 15K
5. What designation is given to an orbital having $n=3, l=0$

2 MARK QUESTIONS

6. Explain why NH_3 has higher dipole moment than NF_3
7. Calculate the temperature at which 28 grams of N_2 will occupy a volume of 10 L at 2.46 atm [at wt of N = 14].
8. Write short note on dipole induced dipole force.
9. 1.82 g. of glucose (molar mass-180) is dissolved in 25g of water. Calculate mass%
10. Density of a gas is found to be 5.46 g/dm^3 at 27°C at 2 bar pressure. Calculate the density at STP.

OR

- (a) Explain the physical significance of van der Waals parameter also give their units.
- (b) In terms of Charles's law explain why -273°C is the lowest possible temperature?

3 MARK QUESTIONS

11. a) Why water exists as a liquid and H_2S exist as gas?
- b) With help of a GRAPH explain Andrews Isotherm for carbon dioxide gas.
12. State postulates of kinetic molecular model of a gas.
13. Draw hybrid orbital diagram for ethene

OR

Draw hybrid orbital diagram for ethyne

14. 3 grams of H_2 react with 29 grams of O_2 to yield water
- Which is the limiting reagent?
 - Calculate the maximum amount of water that can be formed?
 - Calculate the amount of one of the reactants which remains unreacted?
15. A welding fuel gas contains carbon and hydrogen only. Burning a small sample of it in oxygen gives 3.38 g carbon dioxide, 0.690 g of water and no other products. A volume of 10.0 L (measured at STP) of this welding gas is found to weigh 11.6 g. Calculate (i) empirical formula, (ii) molar mass of the gas, and (iii) molecular formula
16. Using VSEPR Theory predict the structure for the following molecules
- a) SF_4 b) XeF_6 c) ClF_3

17. Commercially prepared HCl is 38 % percent by mass. Density is 1.19 g cm⁻³. Calculate the following:
- Molality of HCl solution
 - Molarity of HCl solution
 - Mole fraction of HCl in the solution [at wt of Cl = 35.5, H=1]
18. (a) What are the applications of equilibrium constant?
- (b) Write expression for K_c for the reaction $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- (c) Discuss the effect of PRESSURE AND CATALYST for the reaction
- $$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$$
19. The threshold frequency for the ejection of electrons from a metal is $5.0 \times 10^{14} \text{ s}^{-1}$. Will the photon of radiation having energy $3.0 \times 10^{-19} \text{ J}$ give photo electric effect or not?
20. For the reaction $\text{NH}_4\text{Cl}(\text{s}) \longrightarrow \text{NH}_3(\text{g}) + \text{HCl}(\text{g})$ at 25°C, enthalpy change $\Delta H = +177 \text{ kJ/mol}$ and entropy change $\Delta S = +285 \text{ J/K mol}$. Calculate free energy change ΔG at 25 C and predict whether the reaction is spontaneous or not.
21. (a) Define: (i) Intensive properties (ii) Adiabatic process
whose value does not given amount of substance.
- (b) How closed system is different from open system?
22. a) Calculate the pH of 0.001M NaOH
- b) The wavelength of first spectral line in Balmer series is 6561 Å. Calculate the wavelength of second spectral line in Balmer series.

4 MARK QUESTIONS

23. A lady asked a doctor why she is enable to lose weight though she takes care of diet and exercise. Out of joke, the doctor said, "Law of conservation of mass hold good as if you will lose weight, someone else will gain weight. However, it was all fun as law of thermodynamics really does not work that way. Laws of thermodynamics help us to understand some of the biological processes occurring in our body. Now answer the following questions.

- (i) Why sometimes we are not able to lose weight inspite of proper diet and regular exercise? Explain in terms of first law of thermodynamics.
- (ii) How does the concept of entropy (a measure of randomness) used in thermodynamics explain the death of cell if we do not eat food?

5 MARK QUESTIONS

24. (i) a) Draw the shape of px orbital
- b) Write the orbitals represented by the following quantum numbers
 $n=2, l=3; n=5, l=2$
- c) State the limitations of Bohr's model of an atom.

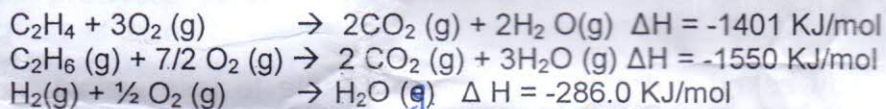
OR

- (ii) a) Draw the shape of a dxy orbital.
- b) Write the values of all the quantum numbers of the valence electron of sodium atom.
- c) State Pauli's Exclusion Principle.
- d) Distinguish between orbit and orbital. (Any 4 points)
25. Explain working and construction of bomb calorimeter using neat and labelled diagram

OR

Calculate enthalpy of
 $C_2H_4(g) + H_2(g) \rightarrow C_2H_6(g) \quad \Delta H = ?$

Data



26. Using M.O theory predict the bond order and magnetic property of N_2^-

Or

Using M.O theory predict the bond order and magnetic property of O_2^{2-}