

SHARADA P.U COLLEGE, MANGALURU

I PUC – CHEMISTRY-MODEL PAPER

MAX. MARKS: 70

Time: 3 Hr

PART - A

I. Answer ALL of the following:

1 x 10 = 10

1. Define limiting reagent
2. Write the vanderwaal's equation for 'n' moles of a real gas.
3. State the modern periodic law.
4. Write the relation between K_p and K_c for the reaction $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_3$.
5. Define oxidation number.
6. What is the type of hybridisation of Boron in diborane?
7. Write the IUPAC name of the compound
 $C_2H_5 - CH_2 - CH_2 - CHO$
8. What is producer gas?
9. Name the most powerful reducing alkali metal ion.
10. Draw the Eclipsed Newmann projection formula for C_2H_6 .

PART - B

II. Answer any FIVE of the following:

2 x 5 = 10

11. Mention any 2 postulates of Dalton's atomic theory.
12. Distinguish between σ bond and π bond (any 2 points)
13. A sample of H_2 gas has volume 906 cm^3 at 27°C . Calculate the temperature at which it will occupy 500 cm^3 of volume
14. Why does Li show anomalous behaviour?
15. What is the action of heat on borax? Write equation only.
16. How is ethyne prepared using calcium carbide?
17. How can you convert propene to 2-bromopropane?
18. What is acid rain? Name 2 major contributions for acid rain.

PART - C

III. Answer any FIVE of the following:

3 x 5 = 15

19. a) Define electron gain enthalpy. How does it vary across the period? (2)
b) Write the IUPAC name of the element whose atomic number is 109. (1)
20. Write 3 postulates of VSEPR theory. (3)
21. Explain sp^3 hybridisation with an example. (3)
22. Write electronic configuration of C_2 molecule. What is its bond order? Mention its magnetic property. (3)
23. Balance the following redox reaction by oxidation number method.
 $Cr_2O_7^{2-} + SO_3^{2-} \rightarrow Cr^{+3} + SO_4^{2-}$ (acid medium) (3)
24. a) Mention the major types of hydrides (1)
b) Explain Clark's method to remove temporary hardness of water. (2)

OR

24. Explain formation of molecular orbitals by LCAO method. (3)
25. Explain manufacture of sodium carbonate by Solvay's process. (3)
26. a) What are silicones? (1)
b) Complete the reactions (2)
i) $SiO_2 + 4HF \rightarrow \dots + \dots$
ii) $Sn + 2H_2O \rightarrow \dots + \dots$

OR

26. a) State the law of definite proportions. (1)
b) Calculate the mass in grams of (2)
i) 0.4 mole of O_2 molecules
ii) 1 molecule of urea (NH_2CONH_2)

PART - D

IV. Answer any FIVE of the following:**5 x 5 = 25**

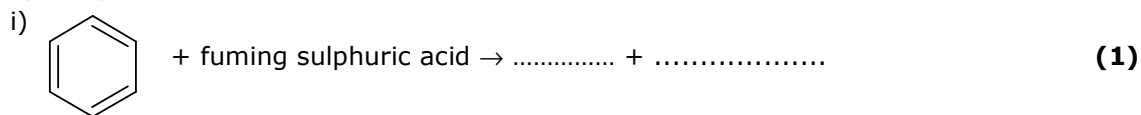
27. a) A substance on analysis gave the following % composition Na = 43.4%, C = 11.3%, O = 45.3%. Determine its empirical and molecular formula if its molecular mass is 106 u: [At mass of (Na = 23, C = 12, O = 16)] (3)
b) 2 dm³ of 4MH₂SO₄ is mixed with 3 dm³ water. What is the molarity of the final solution? (2)
28. a) Give any three postulates of Bohr's atomic model. (3)
b) State Heisenberg's uncertainty principle. (2)
29. a) Write the significance of the 4 Quantum Numbers. (4)
b) Draw the boundary surface diagram of p_y atomic orbital. (1)
30. a) Mention any 3 postulates of Kinetic theory of gases. (3)
b) State Dalton law of partial pressure. (2)
31. a) Calculate the standard enthalpy of formation of methane from the following data. (3)
i) Enthalpy of formation of CO₂, H₂O respectively -393.3 kJ/mol and -286 kJ/mol and enthalpy of combustion of methane is -890.3 kJ/mole.
b) What is entropy? What is its S.I unit. (2)
32. a) Define enthalpy of atomization. (1)
b) What is lattice enthalpy? Explain the Born-Haber cycle for calculation of Lattice enthalpy for formation of 1 mole of NaCl. (4)
33. a) State the Le- Chateliers principle (1)
b) Define Salt-hydrolysis (1)
c) 2 moles of N₂ and 2 moles of H₂ are mixed in a closed vessel. At equilibrium if the vessel contain 1.5 moles of N₂. Calculate the total number of moles present in the vessel. (3)
34. a) Write the conjugate acid of ammonia (1)
b) 8 g of NaOH is dissolved in 10 dm³ of solution. Calculate its pH. (3)
c) Define common ion effect (1)

V. Answer any TWO of the following:**5 x 2 = 10**

35. a) Explain position isomerism with an example. (2)
b) What is +M effect. Give an example of a compound showing +M effect. (2)
c) Define free radical (1)
36. a) 0.405 g of an organic compound gave on combustion 0.292 g of CO₂ and 0.174 g of water. Calculate the percentage of carbon and hydrogen. (3)
b) Write the bond line formula of CH₃(CH₂)₃CH(CH₃)OH. (1)
c) Using Lassaigne's extract, how will you detect sulphur in an organic compound (1)

OR

36. a) State and explain Saytzeff's rule with an example. (3)
b) How can you prepare ethane by Wurtz reaction. (2)
37. a) Explain the mechanism of chlorination of methane (3)
b) complete the reactions:

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