First PUC Annual Examination, January - February - 2019

Time:- 3-15 Hours **SUBJECT : CHEMISTRY (34)** **Max. Marks:- 70**

General Instructions:

i) **The question paper has four parts. A, B. C and D. All the parts are compulsory.**

ii) **Write balanced chemical equations and draw labelled diagrams where required.**

iii) **Use log tables and simple calculators if neccessary (Use of scientific calculators is not allowed).**

PART - A

I Answer ALL the questions. Each question carries ONE mark. **10 X 1 = 10**

1. What is the SI Unit of density?
2. Define critical temperature
3. Define pH of a solution
4. State modern periodic law
5. What is the oxidation number of Mn in $KMnO_4$
6. Write the general electronic configuration of alkali metals
7. What is dry ice
8. Write the composition of water gas
9. Explain the homolytic fission
10. Name the catalyst used in Friedel - craft reaction

PART - B

II Answer any FIVE of the following questions. Each question carries TWO marks. **5 X 2 = 10**

11. Calculate the molarity of a solution containing 2.3 moles of solute dissolved in 4.6 Litres.
12. State Boyle's law and give its mathematical form.
13. The dipole moment in BF_3 is zero. Explain.
14. Give the important uses of plaster of paris.
15. Write the resonance structure of carbonate ion (co_3^{-2})
16. Explain Kolbe's reaction of preparation of ethane.
17. Explain the nitration of benzene.
18. Name the components of photochemical smog.

PART - C

III Answer any FIVE of the following questions. Each question carries THREE marks. **5 X 3 = 15**

19. Define ionisation ethalpy. How it varies along a period and down the group. 3
20. Explain sp^3 hybridisation by taking methane as example. 3
21. Write the electronic configuration of Hydrogen molecule. Calculate its bond order and mention its magnetic property. 3
22. Write the three postulates of VSEPR Theory. 3
23. Balance the following redox reaction by oxidation number method

    $MnO_2 + Br^- \rightarrow Mn^{+2} + Br_2 + H_2o$ (acid medium) 3

24. a) Explain ionic hydrides with an example
    b) What is temporary hardness of water?
25. a) Explain the diagonal relationship between Lithium and Magnesium 3
26. Explain the structure of diborane 3

PART - D

IV Answer any FIVE of the following questions. Each question carries FIVE marks. **5 X 5 = 25**

27. a) A compound contains 4.07% Hydrogen, 24.47% Carbon and 71.65% Chlorine. Its molar mass is 98.96g. What are its empirical formula and molecular formula? 3
    b) Calculate the molecular mass of glucose 2
28. a) Give the postulates of Bohr's theory of an atom. 3
    b) Write down the value of n, l and m for electron present in $2P_z$ orbital. 2
29. a) Explain the significance of quantum numbers. 3
    b) State the Hund's rule of maximum multiplicity. 2
30. a) Write any three postulates of kinetic theory of gases. 3
    b) Write Ideal gas equation and explain its terms. 2
31. a) Calculate the standard enthalpy of formation of Benzene, Given that the enthalpies of combustion of Carbon, Hydrogen and Benzene are -393.5 $KJ\ mol^{-1}$, -285.83 $KJ\ mol^{-1}$ and -3267 $KJ\ mol^{-1}$ respectively. 4
    b) State second law of thermodynamics 1
32. a) What is an intensive property? Give an example. 2
    b) State Hess's law of constant heat summation 2
    c) What is exothermic reaction? 1
33. a) To prove that $pH + pOH = 14$ at 298K 2
    b) Calculate the pH of 0.01M H_2SO_4 by assuming complete ionisation. 2
    c) Define the Buffer action. 1
34. a) Explain the common ion effect with an example. 2
    b) Discuss amphoteric nature of water with an example. 2
    c) Write the conjugate acid for SO_4^{2-} 1

V Answer any TWO of the following questions. Each question carries five marks. **2 X 5 = 10**

35. a) With neat labelled diagram, describe the estimation of nitrogen by Dumas method 3
    b) Give any two differences between Inductive effect and Resonance effect 2
36. a) What are free radical? How are they formed? 2
    b) Write the structure of 3-methyl-pentanal 2
    c) Give the example for +R effect 1
37. a) Explain free radical mechanism of chlorination of methane. 3
    b) Explain the mechanism of addition of HBr on propene 2