Jain College, Jayanagar
I PUC Mock Paper
Subject: Chemistry (34)

Timeings : 3 hrs 15 minutes Max. Marks: 70

Instructions:
(i) The question paper has four parts:A,B,C and D. All parts are compulsory
(ii) Write balanced chemical equations and draw labeled diagrams wherever required
(iii) Use log tables and simple calculator if necessary.

PART A

I. Answer all the following. Each question carries 1 mark. 10x1=10

1. Which is the chemical responsible for the depletion of ozone?
2. The size of weather balloon becomes larger and larger as it ascends up into higher altitude. Which gas law explains the above phenomenon?
3. What is a strong electrolyte?
4. What is the trend in metallic character of elements down the group?
5. Calculate the oxidation number of Cr in $Cr_2O_7^{2-}$
6. Why group I elements are called as alkali metals?
7. Write the chemical composition of Borax?
8. What is water gas?
9. Name the process used to separate sugar and salt?
10. Which metal is used in Wurtz reaction?

PART-B

II. Answer any FIVE of the following. Each question carries 2 marks. 5x2=10

11. A plastic jug contains 3.5L of milk. Calculate the volume of milk in m^3.
12. State Avogadro's law. Write the mathematical representation of law.
13. The dipole moment in BF_3 is zero. Explain.
14. Give reason for the low solubility of LiF and CsI in water.
15. How is orthoboric acid prepared from borax?
16. Draw the Newman's projection of ethane.
17. $CH_3-C\equiv C-CH_3 \xrightarrow{Na+NH_3,\ heat} X$

    $CH_3-C\equiv C-CH_3 \xrightarrow{H_2/Pd/BaSO_4,\ Heat} Y$ Identify X and Y
18. What are harmful effects of acid rain?

PART-C

III. Answer any FIVE of the following. Each question carries 3 marks. 5x3=15

19. How does electron gain enthalpy vary down the group and along the period? Give reason.
20. State the postulates of VSEPR theory?
21. Show that oxygen molecule is paramagnetic based on Molecular Orbital Theory.
22. Explain the formation of $BeCl_2$ using hybridization.
23. Balance the following equation by oxidation number method
    $Fe^{2+}+H^{+}+Cr_2O_7^{2-} \longrightarrow Cr^{+3}+Fe^{+3}+H_2O$
24. Give one industrial method of preparation of H_2. Explain the amphoteric nature of water.
25. Explain the reactivity of alkaline earth metal towards halogens, acids and air.
26. How to synthesize organosilicon polymers?

PART D

IV. Answer any FIVE of the following. Each question carries 5 marks. 5x5=25

27. (a) An organic substance containing carbon, hydrogen and oxygen gave the percentage composition as C= 40.687%, H=5.085% and O=54.228% .The vapor density of compound is 59.Calculate the molecular formula of the compound.
    (b). Give the S.I unit of (1).Luminous Intensity (2). Amount of the substance **[3+2]**
28. (a) Write the postulates of Bohr's atomic model.

(b) Calculate the wave number of spectral line of shortest wavelength appearing in the Balmer series of hydrogen spectrum ($R_H = 1.09 \times 10^7\ m^{-1}$)

[**3+2]**

29. Explain the significance of four quantum numbers. How many electrons in an atom may have the following quantum numbers n=3, l=0? **[5]**
30. (a) On a hot summer day, pressure in well inflated tyre of an automobile increases considerably and tyre may burst if pressure is not adjusted properly. Name the gas law suitable for above phenomenon. State the law and write the mathematical statement for the above law.
    (b). Under what condition real gases tend to show ideal gas behaviour? **[3+2]**
31. (a) For the reaction

    $2A_{(g)} + B_{(g)} \longrightarrow 2D_{(g)}$

    $\Delta U_{298} = -10.5kJ$ and $\Delta S = -44.1Jk^{-1}$

    Calculate ΔU_{298} for the reaction and predict whether the reaction is spontaneous or not?
    (b) Explain the spontaneity of exothermic reaction using Gibb's equation. **[3+2]**
32. (a) Explain the determination of ΔU using bomb calorimeter.
    (b) Define (i) Specific heat capacity
    (ii) Enthalpy of vaporization **[3+2]**
33. (a) Explain the effect of pressure, concentration and temperature using LeChatlier's principle on the reaction. $N_{2\,(g)} + 3H_{2\,(g)} \rightleftharpoons 2NH_{3\,(g)}$ H= -x kJ

    (b) Explain Lewis concept of acids and bases with an example. **[3+2]**
34. (a) Calculate pH of 0.1M weak monobasic acid whose dissociation constant is 4×10^{-10} at 298K.
    (b) What is solubility product? What is the relationship between solubility and solubility product of salt AB_2type. **[3+2]**

V. Answer any TWO of the following. Each question carries 5 marks. 5x2=10

35. (a).How is the estimation of halogens done by Carius method?
    (b)Explain inductive effect with an example. **[3+2]**
36. (a) Give a note on thin layer chromatography.
    (b) Write the structural formula of 4-chloro-2-hexene and mention the type of hybridization of each carbon in it.
    [3+2]
37. (a) Write the steps involved in mechanism of nitration of benzene.
    (b) An alkene 'A' on ozonolysis give a mixture of products CH_3-CHO and $CH_3-CH_2-CO-CH_2-CH_3$. Write the structure and IUPAC name of alkene 'A' **[3+2]**

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