Jain College, Jayanagar
I PUC Mock Paper, Dec - 2018
Subject: I PUC Chemistry (34)

Duration: 3 hours 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

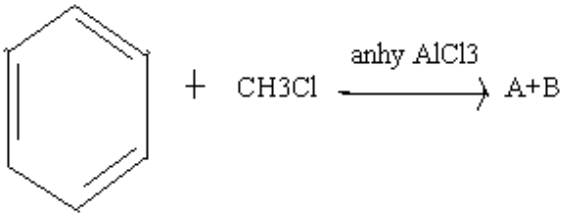
I. Answer all the following. Each question carries 1 mark. 10x1=10

1. Which is the chemical responsible for the depletion of ozone?
2. Write the dimensions of surface tension.
3. What is the pH of 10^{-2}M HCl solution?
4. State Mendeleev's periodic law.
5. Complete the following equation

   $2Fe^{2+}+H^{+}+H_2O_2 \rightarrow$ _____ $+2H_2O$
6. Why group I elements are called as alkali metals?
7. What is producer gas?
8. Why carbon shows allotropic forms?
9. Which type of E effect operates during the attack of proton on ethane molecule?
10. What is Lindlar's catalyst?

PART-B

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

11. State law of definite proportion.
12. Give any four postulates of kinetic theory of gases.
13. Draw the Lewis symbols for CO and Cl_2 molecules.
14. Why does Lithium show anomalous behaviour?
15. Why carbon monoxide is poisonous? Explain.
16. Explain any one method for preparation of alkanes.
17. 

    What are A and B? Name the above reaction.
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. Given: Element Electronic configuration

    P $1s^2\ 2s^2$

Q $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

R $1s^2\ 2s^2\ 2p^6\ 3s^1$

S $1s^2\ 2s^2\ 2p^4$

i) Arrange P, Q, R and S in decreasing order of their atomic radii.

ii) Which one among these is a chalcogen?

iii) Which one among these has more positive electron gain enthalpy?

20. Based on VSEPR theory, explain the geometry of NH_3 molecule.
21. Based on MOT, show the non existence of Helium molecule. Comment on its magnetic property.
22. Define dipole moment. Give its SI unit.
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 the structure of H_2O_2 in liquid form and write the equations for reducing and oxidizing nature of H_2O_2 in acidic medium.
25. Explain the manufacture of Sodium hydroxide by Caster-Kellner's cell.
26. Explain the structure of Diborane.

PART D

IV. Answer any FIVE of the following. Each question carries 5 marks. 3x5=15

27. (a).Write any three postulates of Dalton's atomic theory.

(b). How many moles of methane are required to produce 88g of CO_2 after combustion?

[3+2]

28. (a). What are the conclusions drawn regarding the structure of atom on the basis of observations in the α-ray scattering experiment.

(b).What are isoelectronic ions? Give an example. [3+2]

29.(a). Write the three limitations of Bohr's atomic model.

(b). State Hund's rule of maximum multiplicity. [3+2]

30. (a). 2.9g of a gas at 95°C occupies the same volume as 0.814g of dihydrogen at 17°C at the same pressure. What is the molar mass of the gas?

(b).Two gases A and B have critical temperature of 250K and 125K respectively. Which one of these can be liquefied easily and why?
[3+2]

31. (a) State Hess's law.
(b) Explain the Born-Haber cycle for the formation of NaCl crystal and give its lattice enthalpy.[3+2]

32. (a). A swimmer coming out of a pool is covered with a film of water weighing about 18g. How much heat must be supplied to evaporate this water at 298K? Calculate the change in internal energy during evaporation at 100°C.

Given: $\Delta_{vap}H$ for water is at 373K =40.66Kj/mol

(b). For $H_{2\,(g)} \longrightarrow 2H_{(g)}$ Assign the signs for ΔH and ΔS [3+2]

33. (a). Derive Henderson-Hesselbalch equation for acidic buffer.

(b). what are conjugate acid-base pairs? Explain with an example. [3+2]

34. (a).The Ksp values of $BaSO_4$ and PbI_2 are $1.1x10^{-10}$ and $7.1x10^{-9}$ respectively. Which salt is more soluble?

(b). Explain common ion effect with an example?

V. Answer any TWO of the following. Each question carries 5 marks. 4x5=20

35. (a).How is the Nitrogen determined quantitatively by Kjeldahl's method.

(b)Explain the hyperconjugation effect with an example. [3+2]

36. (a)Explain positive and negative resonance effect.

Give the IUPAC name for $CH3-\overset{\overset{O}{\|}}{C}-CH(\overset{\overset{CH_3}{|}}{})-CH_2-CH_2Cl$

(b) Give one test for detection of Carbon and Hydrogen qualitatively. [3+2]

37.a) Explain the mechanism of nitration of Benzene.

b) Addition of HBr to propene yields 2-bromopropane, while in the presence of benzoyl peroxide, the same reaction yields 1-bromopropane. Name the rule and explain the mechanism

[3+2]

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