First PUC Annual Examination - February - 2020

Time : 3-15 Hrs. **Subject - Chemistry (34)** **Max. Marks : 70**

Instructions :

a. **The question paper has four parts A, B, C & D. All the parts are compulsory**
b. **Write balanced Chemical equations and draw labelled diagrams wherever asked.**
c. **Use log tables & simple calculators if necessary. (Use of scientific calculators is not allowed.)**

PART - A

I Answer all the following question in one word or one sentence each. **10x1=10**

1. Define molality of solution.
2. Write ideal gas equation for 'n' moles of a gas.
3. Give the relation between K_p & K_c
4. Select an iso electronic pair among the following.
   Na^+, Cl^-, F^-, Li^+
5. What is the Oxidation number of Manganese (Mn) in K_2MnO_4 ?
6. Why is Sodium metal preserved in Kerosene?
7. What is Catenation?
8. Give the composition of water gas.
9. What is R_f value?
10. What is pyrolysis?

PART - B

II Answer any FIVE questions, Each questions carries TWO marks. **5x2=10**

11. Calculate the molarity of NaoH solution prepared by dissolving '4g' of it in 250ml of water.
12. Why do real gases deviate from ideal behavior?
13. Explain the non existence of helium molecule on the basis of molecular orbital theory (MOT).
14. Explain the action of carbon dioxide on lime water.
15. How is diborane prepared in the laboratory?
16. Explain Markovnikov's rule with an example.
17. What are the necessary condition for a system to be aromatic?
18. Write any two common chemicals of photo chemical smog.

PART - C

III Answer any FIVE questions, each question carries THREE marks. **5x3=15**

19. What is electron gain enthalpy? How does it varies along a period and group.
20. a) Distinguish between Sigma bond & Pi-bond.
    b) Define dipole moment. **2 + 1**
21. Write any three postulates of 'VSEPR' theory.
22. On the basis of MOT. Calculate the bond order of Oxygen molecule & predict its magnetic property.
23. Balance the following redox reaction by oxidation number method.
    $MnO^-_{4\,(aq)} + Br^-_{(aq)} \rightarrow Mno_2(s) + Bro^-_{3\,(aq)}$ (Acidic median)
24. Explain the Clarke's method of removing temporary hardness of water (Give equation)
25. Give the preparation of sodium hydroxide by Caster-Kellner-Cell method.
26. a) Mention any 2 difference between diamond & graphite.
    b) Name the inorganic benzene. **2 + 1**

PART - D (IV)

IV Answer any FIVE questions, each questions carries FIVE marks. **5x5=25**

27. a) Find the empirical formula of a compound which contains 33.18% of carbon, 4.60% of hydrogen, 29.49% of oxygen & 32.72% of chlorine respectively,
    (At masses : C=12, H=1, O=16, Cl=35.5)

b) State Avogadro's law.

c) How many significant figures are there in the number, 0.0025? **3 + 1 +**

28. a) Give the postulates of Bohr's atomic model.

b) Write the electronic configuration of copper (z=29) **4 + 1**

29. a) Calculate the energy of radiation with wave length 500nm

b) State Heisenberg's uncertainty principle & Give its mathematical expression.

c) Name the spectral lines which lies in the Uv region. **2 + 2 + 1**

30. a) Write any postulates of Kinetic theory of gases.

b) Give reason liquid drops are spherical in shape. **4 + 1**

31. a) State & Explain Hess's law.

b) Give the mathematical expression for First law of thermodynamics

c) Write the S.I unit of entropy. **3 + 1 + 1**

32. a) What is an isolated system? Give example.

b) Which allotropic form of carbon is more stable?

c) What is a spontaneous process? Give example. **2 + 2 + 1**

33. a) State Le-chatelier's principle.

Describe the effect of i) addition of H_2

ii) addition of CH_3OH on the equilibrium reaction.

$$2H_{2(g)} + CO_{(g)} \quad CH_3OH_{(g)}$$

b) Write an expression for K_p for the following reaction.

$$CaCO_{3(s)} \rightleftharpoons CaO_{(s)} + CO_{2(g)}$$

c) Give an example of reaction where Kp = Kc **3 + 1 + 1**

34. a) Write conjugate acides for CN^-, H_2O

b) Calculate the PH of 0.01M NaoH solution

c) Define Solubility product. **2 + 2 + 1**

V Answer any TWO of the following questions each carries five marks. **2x5=10**

35. a) Draw a neat labelled diagram & give the principle involved in the estimation of halogen by carius method.

b) What is functional isomerism? Give example **3 + 2**

36. a) Differentiate between Inductive effect & electromeric effect.

b) Give the IUPAC name of CH_3-CH_2-CH=CH-COOH

c) Name the separating method used for the separtion of glycerol from spent lye.

d) What are Free-radicals? **2 + 1 + 1 + 1**

37. a) Give the mechanism of chlorination of benzene.

b) Name the reaction involved in the conversion of benzene to toluene.

c) What is a carcinogen? **3 + 1 + 1**