Code No.20CC20

DISTRICT LEVEL I PUC ANNUAL EXAMINATION, FEB-2020

Time: 3 Hrs. 15 Mins. **Sub: CHEMISTRY (34)** **Max. Marks: 70**

Instructions:

1. The question paper has four parts A, B, C and D. All parts are compulsory.
2. Write balanced chemical equations and draw labelled diagrams wherever required.
3. Use log tables and simple calculator if necessary. (use of scientific calculators is not allowed)

Part – A

I. **Answer ALL the following questions in one word or in one sentence** **10 × 1 = 10**

1. Write the multiple for the prefix mega.
2. At constant volume "Pressure of a fixed amount of a gas varies directly with the temperature". Which law is this?
3. Write the equilibrium constant expression for the reaction $Ni_{(s)} + 4CO_{(g)} \rightleftharpoons Ni(CO)_{4(g)}$.
4. State Mendeleev periodic law.
5. What is the oxidation state of 'P' in $H_2P_2O_7$?
6. Name the radioactive alkali metal.
7. Which compound is known as inorganic benzene?
8. Mention any one allotropic form of carbon which is SP^2 hybridised.
9. Expand the condensed formula into complete structural formula for $CH_3CH_2COCH_2CH_3$.
10. Draw the staggered conformation of ethane by Newman's projection formula.

Part – B

II. **Answer any FIVE of the following questions (Each question carries two marks)** **5 × 2 = 10**

11. (a) How many significant figures are present in 6007?
    (b) State Avogadro's law.
12. Derive an ideal gas equation.
13. Mention two conditions for the formation of ionic bond.
14. Give equation for the reactions that occurs when (i) Sodium metal is dropped into water (ii) CO_2 gas is passed into sodium carbonate solution.
15. What is the action of water on borax? Write chemical equation.
16. Explain Wurtz reaction with example.
17. How do you convert ethyne to benzene? Write the equation.
18. What is green house effect? Give example for green house gases.

Part – C

III. **Answer any FIVE of the following questions (Each question carries three marks)** **5 × 3 = 15**

19. (a) Give one example for isoelectronic species. [1M]
    (b) Define electron gain enthalpy. How does it vary along the period of the periodic table? [2M]
20. Write any three postulates of "VSEPR" theory [3M]
21. Explain sp^3 hybridisation in CH_4 molecule. [3M]
22. (a) For carbon molecule (i) Write electronic configuration (ii) Calculate its bond order. [3M]
23. Suggest a scheme of classification for the following redox reaction [3M]
    (i) $N_{2(g)} + O_{2(g)} \rightarrow 2NO_{(g)}$ (ii) $2KClO_{3(s)} \xrightarrow{\Delta} 2KCl_{(s)} + 3O_{2(g)}$
    (iii) $Cl_{2(g)} + 2OH^-_{(aq)} \rightarrow ClO^-_{(aq)} + Cl^-_{(aq)} + H_2O_{(l)}$
24. (a) Explain the process of softening of temporary hardness of water by Clark's method. [2M]
    (b) What is coal gasification? [1M]

25. (a) How is calcium hydroxide prepared? [2M]
(b) Give any one biological importance of magnesium. [1M]

26. (a) Explain the structure of graphite. [2M]
(b) What is dry ice? [1M]

Part - D

IV. **Answer any FIVE of the following questions (Each question carries Five marks)** **5 × 5 = 25**

27. (a) Define molality. [1M]
(b) An unknown compound was found to contain 34.24% Sodium, 18% Carbon and 47.76% Oxygen. The molar mass of the compound is 134 g/mol. Find out its empirical formula and molecular formula. (Given atomic mass of Na = 23) [4M]

28. (a) Explain Rutherford model of an atom. [3M]
(b) Calculate the mass of a photon with wavelength 2.5 A^0. [2M]

29. (a) Give the significance of any three quantum numbers. [3M]
(b) How many number of nodes are there for 3S – orbital? [1M]
(c) State Aufbau principle. [1M]

30. (a) Mention any three postulates of kinetic theory of gases. [3M]
(b) What is the critical temperature of CO_2? [1M]
(c) Viscosity of liquid decreases with increase of temperature why? [1M]

31. (a) Explain intensive property with an example. [2M]
(b) Calculate the standard enthalpy of combustion of methane. Given that standard enthalpy of combustion of carbon, hydrogen are $-393.5\ KJ$, $-285.83\ KJ$ respectively. Standard enthalpy of formation of methane is $-75.16\ KJ$. [3M]

32. (a) What is lattice enthalpy? [1M]
(b) What happens to entropy when (i) Temperature of a crystalline solid is raised from 0K to 115K. (ii) $H_{2(g)} \rightarrow 2H_{(g)}$ [2M]
(c) Write Gibbs equation. Using 'ΔG' value, how do you decide whether a reaction at a given temperature is spontaneous or non spontaneous? [2M]

33. (a) Explain homogeneous equilibria with an example. [2M]
(b) The value of K_c for the reaction $2A \rightleftharpoons B + C$ *is* 2×10^{-3}. At a given time, the composition of reaction mixture is $[A] = [B] = [C] = 3 \times 10^{-4} m$. In which direction the reaction will proceed? [3M]

34. (a) Explain the effect of change in temperature on equilibrium according to "Lechatelier's principle". [2M]

(b) What is common ion effect? Give an example. [2M]
(c) Define acid according to Lewis theory. [1M]

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

35. (a) What is position isomerism? Give one example. [2M]
(b) Give any two differences between inductive effect and electromeric effect. [2M]
(c) Give the IUPAC name for the following: Cl_2CHCH_2OH [1M]

36. (a) Describe the estimation of halogen by Carius method. [3M]
(b) From which method of purification of organic compound, aniline and water mixture is separated? [1M]
(c) What is the observation made in sodium nitroprusside test for the detection of sulphur in organic compound? [1M]

37. (a) Explain the mechanism of nitration of benzene. [3M]
(b) Give a reaction to show the presence of three double bond in benzene. [1M]
(c) What are meta directing groups? [1M]