



SRI BHAGAWAN MAHAVEER JAIN COLLEGE

Vishweshwarapuram, Bangalore 560004

Mock Examination Question Paper - January 2019

Course:	I PUC
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Subject:	Chemistry
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Max. Marks:	70
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Duration:	3:15 hrs.
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Instructions:

The question paper has five parts A, B, C, D₄ and D₅.

Write balanced chemical equations and neat labelled diagram wherever necessary.

Use log table and simple calculator for calculation.

PART-A

I Answer ALL the following. Each question carries one mark.

10 x 1 = 10

- Express 0.053 in scientific notation.
- Mention the SI unit of coefficient of viscosity.
- What is common ion effect?
- Among Mg and Ca which has larger atomic radius.
- Identify the oxidising agent in the following reaction, $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$.
- Which alkali metal is strongest reducing agent.
- What are zeolite?
- Give the formula of inorganic benzene.
- Write the IUPAC name of $\text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CHO}$
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OH

10 What is Lindlar's Catalyst?

PART-B

II Answer any FIVE questions. Each question carries two marks.

5 x 2 = 10

- Calculate the amount of water produced by the combustion of 32g of methane.
- Give any two difference between real and ideal gases.
- State Octet rule. Mention one of its limitation.
- How does Li and Na react with O₂ on burning? Give equations.
- What are silicates? Give an example.
- Give equations for the following reaction.
(i) Ethyne is treated with Baeyer's reagent.
(ii) Hydrogen bromide is added to propene in presence of peroxide.
- What happens when 1, 2 dibromoethane is heated with Zn dust? Give equation.
- How is ozone layer formed in the stratosphere? Name a chief chemical that causes its depletion.

PART-C

III Answer any FIVE question. Each question carries three marks.

5 x 3 = 15

- a) The radius of Na⁺ cation is less than that of Na atom. Give reasons?
b) Define ionisation enthalpy.

2+1

- 20 Give the molecular orbital energy diagram for oxygen molecules and account for its paramagnetic property. 3
- 21 a) Predict the shapes of BeCl_2 Molecule based on VSEPR theory.
b) Write the electronic configuration of N_2 Molecule. 2+1
- 22 a) Dipole moment of $\text{NF}_3 < \text{NH}_3$. Give reason.
b) Give the mathematical expression for dipole moment. 2+1
- 23 Balance the following redox reaction using oxidation number method
 $\text{MnO}_4^- + \text{Br}^- \rightarrow \text{MnO}_2 + \text{BrO}_3^-$ in basic medium.
- 24 a) What are Ionic hydrides? Give example.
b) Complete the reaction. $\text{C}_{(s)} + \text{H}_2\text{O}_{(g)} \xrightarrow{\Delta} ?$. 2+1
- 25 a) Describe the manufacture of sodium hydroxide by Castner-Kelner process.
b) What is slaking of lime? 2+1
- 26 Give reason.
(a) Graphite is soft and slippery.
(b) Boron is used as control rods in nuclear reaction.
(c) The stability of +3 oxidation state of 13 group elements decreases down the group. 1+1+1

PART-D₄**IV Answer any FIVE questions. Each question carries five marks****5 x 5 = 25**

- 27 a) 500 ml of Na_2CO_3 solution contains 2.65 g of Na_2CO_3 (mol mass of $\text{Na}_2\text{CO}_3=106$) if 10ml of this solution is diluted to 1L. What is the concentration of the resultant solution?
b) Mention any two postulates of Dalton's atomic theory.
c) Give the SI unit of force. 2+2+1
- 28 a) Mention any three postulates of Bohr's theory of atomic model.
b) The threshold frequency ν_0 for a metal is $7.0 \times 10^{14} \text{S}^{-1}$. Calculate the kinetic energy of an electron emitted when radiation frequency $\nu = 1.1 \times 10^{15} \text{S}^{-1}$ hits the metal. ($h = 6.626 \times 10^{-34} \text{Js}$) 3+2
- 29 a) State Hund's rule of maximum multiplicity.
b) Mention the significance of principal and azimuthal quantum numbers.
c) Calculate the energy of the Photon which corresponds to light of frequency $3 \times 10^{15} \text{Hz}$ ($h = 6.626 \times 10^{-34} \text{Js}$) 1+2+2
- 30 a) Calculate the pressure exerted by 88g of CO_2 occupying a volume of 1.5 L at 100K.
($R = 0.0821 \text{ L atm / K / mol}$)
b) State Boyle's law. Give its mathematical form. 3+2
- 31 a) State first law of thermodynamics and give its mathematical form.
b) Calculate the total work done when 1 mole of a gas expands iso thermally and reversibly from an initial value of 20dm^3 to a final value of 40dm^3 at 298 K. ($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$)
c) Give an example for isolated system. 2+2+1

- 32 a) What is lattice enthalpy? How do you calculate the lattice enthalpy of sodium chloride by using Born-Haber cycle?
b) Define the term entropy. What happens to entropy, when a liquid crystallizes into a solid? 3+2
- 33 a) The ionisation constant of acetic acid is 1.74×10^{-5} . Calculate the degree of dissociation of acetic acid in its 0.05M solution. Calculate the conc of acetic ions in the solution.
b) The concentration of hydrogen in a sample of soft drink is 3.8×10^{-3} M. What is its P^H . 3+2
- 34 a) State Lechatelier's principle.
b) Equilibrium constant for a reaction is 2×10^{13} at 300K. Calculate ΔG° at the same temperature.
c) Give an example for acidic buffer. 2+2+1

PART-D₅

V Answer any TWO question. Each carries five marks. 2 x 5 = 10

- 35 a) Give the IUPAC name for the compound. $CH \equiv C - CH = CH - CH_3$.
b) Identify the number of sigma and Pi bonds.
c) Identify the type of hybridisation of each carbon atom.
d) Write the bond line formula of the compound.
e) Mention whether the compound is saturated or unsaturated. 2+2+1
- 36 a) Write the principle and calculation involved in the estimation of carbon present in an organic compound.
b) Explain Lassaignes test to detect the presence of S in an organic compound. 3+2
- 37 a) Write three steps involved in the mechanism of alkylation of benzene.
b) Explain Wurtz reaction with an example. 3+2
