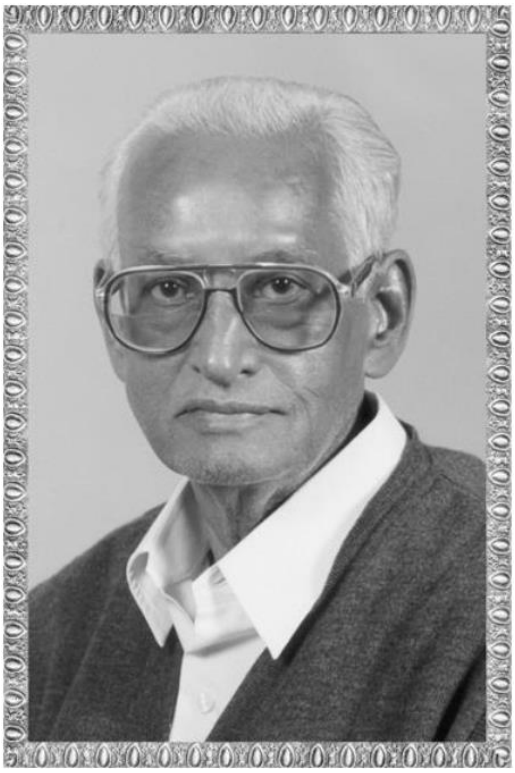

Lt. Shree Cimanbhai Shukla

B. Sc. Chemistry Semester-4 – Unit-1,2,35

Question bank

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Question for one mark

1. Give the definition of organo-metallic compounds.
2. Provide the name of organo-metallic compound having ionic bond.
3. Give the example of organo-metallic compounds having co-valent bond.
4. Give example of sandwich type organo-metallic compound.
5. Privide the structure of Trimethyl aluminum dimer.
6. Give the structure of ferrocene.
7. Give the structure of Zeise salt.
8. Alkali metals give which type of organo-metallic compounds?
9. Methyl lithium is a type of organo-metallic compound?
10. Which metal groups forms co-valent organo-metallic compounds?
11. Trimethyl aluminum is which type of organo-metallic compound.
12. Give the example of electron deficient organo-metallic compound.
13. Provide the example for organo-metallic compound having banana bond.
14. What are Ylides?
15. Clarify Ionic organo-metallic compound.
16. Simplify sigma bonded organo-metallic compounds.
17. Write IUPAC name of ferrocene.
18. Give the IUPAC name of K[PtC13(C2114)].
19. Write the formula of Bis (t15-cyclopentadie-nyl) iron (II).
20. Provide the types of organo-magnesium compounds.
21. What is the Grignard reagent?
22. In $K[PtC1_3(C_2H_4)]$, Carbon have which type of hybridization?
23. Which type of hybridization occurs for aluminum in Trimethyl aluminum dimer?
24. Clarify three centre two electron (3c-2e) bond.
25. Give example of organo-metallic compound having aromatic properties?
26. In Ferrocene, carbon atom having which type of hybridization?
27. Give the structure of wittig reagent.
28. Wittig reagent is which type of organo-metallic compounds. What is Bio-inorganic chemistry?
29. Define Macro-nutrients or Principle elements.
30. Give the examples of macro-nutrients.
31. Give definition Micro or Trace elements.
32. Provide the examples of trace elements.
33. Give the structure of porphyries.
34. Define metallo-porphyries.
35. Which elements are responsible for red colour of blood?
36. How many Herne units are arranged in Hemoglobin?
37. How many Fe-atoms presents in one mole of Hemoglobin.
38. Porphyrin ring is made by how many Nitrigen containing cyclic rings?
39. In mankind, 100 ml of blood contains how many grams of Hemoglobin?
40. In Hemoglobin which base molecule is bridged between Heme and Globin?
41. What is the oxidation state for Iron in Heme ?
42. Give the name of bio-molecule which is responsible as oxygen carrier:6)
43. What is the difference in the structure of Chlorophyll-a and Chlorophyll-b?
44. Which element is involved in structure of Chlorophyll? 18. Give photo-synthesis reaction.

45. Provide light reaction step of photo-synthesis.
46. What is the dark reaction step in photo-synthesis?
47. Which metal is very toxic for human beings?
48. Which molecules of Lead are added to gasoline to reduce knocking?
49. How Lead poisoning is cured?
50. The effect of Mercury poisoning may be reduced by giving which tablets?
51. A disease known as "Itai-Itai" in Japan occurred from which toxic elements?
52. How many elements included in group-0 or group-8?
53. Provide the list of noble gases?
54. What is the atomic number of Xenon and Redon?
55. What is the electronic configuration of inert gases?
56. Which noble gas is not present in atmosphere?
57. Give the name of noble gas having radioactive properties.
58. Which inert gas is the exception of ns2 np6 electronic configuration?
59. Provide the electronic configuration of Krypton.
60. Helium is occurs up to 7 % from which minerals in nature?
61. Which inert gas is first observed spectroscopically in sun's atmosphere?
62. Which scientist first makes a number of experiments to determine the composition of air?
63. What is the meaning of Helios, from which name Helium is given?
64. Who is investigated element Redon?
65. Which compounds of noble gases known before 1962?
66. Which noble gas is formed most stable hydrates? Give structure of these hydrates.
67. Which noble gases cannot make Clathrates?
68. Which noble gases make Clathrates?
69. How many lone pair of electrons present in $Xe0_2F_2$?
70. Which Xenon compounds have property as explosive when it is dry?
71. Which gas mixture is used to assist breathing in asthma?
72. For blue or green glow, which vapors are mixed with neon for advertising purpose?
73. Give the name of noble gas which used in treatment of cancer.
74. Provide preparation of
    (i) XeF_4 (ii) $XeOF_2$ (iii) XeO_2F_2 (iv) KrF_2
75. Give the uses of Redon.
76. Complete the reactions.
    $XeF_2 + 12\ BF_3 \rightarrow$
    $XeF_2\ 2S0_3 \rightarrow$
    $3XeF_4 + 4BC1_3 \rightarrow$
    $2XeF_4 + 3H_20 \rightarrow$
    $Xe0F_4 + 3Si0_2 \rightarrow$
    $Xe0F_4 + H_2O \rightarrow$
    $2Xe0_2F_2 + Si0_2 \rightarrow$
    $2Kr\ F_2 + 2H_20 \rightarrow$
    $XeOF_4 + Xe0_3 \rightarrow$
77. Define or Explain the terms :
    a) Thermodynamics b) Zeroth law of thermodynamics c) Surrounding d) system
    e) surroundings f) Homogrnious systrm g) Heterogeneous system h) Open system
    i) Closed System j) Isolated system k) Macroscopic properties l) State variables

m) Thermodynamic Equilibrium n) Isothermal Process o) Adiabatic process
p) Isobaric process q) Isochoric process r) Cycylic process s) Internal energy
t) Enthalpy u) Molar heat capacity v) State of system w) Extensive Properties
x) Intensive property y) Reversible process z)Irreversible process

78. Provide the relation between CP and Cv.
79. Provide the examples of Extensive properties.
80. Give the examples of intensive properties.
81. Give the type of Extensive or intensive properties
    (i) Density (ii) Surface Tension (iii) Volume (iv) Entropy
82. How would the energy of an ideal gas change if it is made to expand into vacuum at constant temperature?
83. Which system that can transfer neither matter nor energy to and from its surroundings ?
84. A thermos flask is an example of which type of system?
85. A gas contained in a cylinder filled with a piston constitutes, is which type of
86. Which system that can transfer both energy and matter to and from its surroundings ?
87. Zinc granules reacting with dilute hydrochloric acid in an open beaker constitute is which type of system?
88. In which process, no thermal energy passes into or out of the system?
89. Volume is which type of property?
90. What do you understand by Cr and Cv of gases?
91. Why is the value of CP always greater than Cv?
92. Provide the mathematical relation for the first law of thermodynamics.
93. Give the equation for the enthalpy change (All)

Fill in the Blanks

94. An isobaric process takes place at constant…….
95. An isochoric process takes place at constant……
96. For a cyclic process, the change in internal energy of the system is…….
97. Organo-metallic compounds are, which is having one or more…… Bonds. (Carbon-Metal)
98. The formula of Zeise's salt is…… ($K[PtC1_3(C_2H_4)]$)
99. Grignard reagent is an organo…….. Compouns. (Magnesium)

True or False statements

100. Ferroene is a n-bonded complex. **True**
101. C2H50Na is an organo-metallic compound. **False**
102. Ferrocene has a sandwich structure. **True**
103. Trimethyl aluminum has a Ionic structure. **False**
104. Trimethyl aluminum is a electron deficient organo-metallic compound. **True**
105. Mg-elements are present in Hemoglobin. **False**
106. Cadmium compounds are carcinogenic. **True**
107. Toxicity of Mercury is, irreversible inhibition of Magnesium enzymes. **False**
108. In Chlorophyll, Mg-atom is replaced by H-Atom, which gives Yellow or White Colour to the leaves. **True**
109. **Which of the following relations is true?**

(a) Cp > Cv (b) Cv > Cp (c) Cp = Cv (d) Cp = Cv = 0

110. The heat capacity at constant pressure is related to heat capacity at constant volume by the relation

(a) Cp — R = Cv (b) Cv — R = Cp (c) Cp — Cv = R (d) R — Cp = Cv

111. The phenomenon of lowering of temperature when a gas is made to expand adiabatically from a region of high pressure into a region of low pressure is known as,
(a) First law of thermodynamics (b) Second law of thermodynamics (c) Le Chatlier's principle (d) Joule Thomson effect

Question for Two or three marks

112. Give the definition of organo-metallic compounds with two examples.
113. Provide the example organo-metallic compound having Ionic and co-valent bond.
114. Give the structure for Trimethyl aluminum and Zeise salt.
115. Describe in short for classification of organo-metallic compounds based on Hantacity.
116. Discuss : Classification of organo-metallic compounds based on M-C bond
117. Give the preparation of organo-lithium compounds.
118. Explain preparation of organo-magnesium compounds.
119. Provide the synthesis of Grignard reagent.
120. How are organo-lithium compounds used to prepare primary, secondary and tertiary alcohols.
121. How are Grignard reagents nwl to prepare primary, secondary and tertiary alcohols.
122. Discuss Preparation of other organo-metallic compounds from organo-lithiums.
123. Discuss Preparation of other organo-metallic compounds from Gritpard reagents.
124. Explain structure of Ferrocene.
125. Explain structure of Trimethyl aluminum.
126. Clarify structure of Zeise's salt.
127. Provide the resonance structure of cyclopenta-dienyl anion.
128. Give Staggered and eclipsed structure of Ferrocene.
129. Give any three synthesis of Ferrocene.
130. Provide any three preparation of Zeise's salt.
131. Discuss any three preparation of Trimethyl aluminum. 1. Describe metallo-porphyrins.
132. Provide the structure of Heme.
133. Discuss the structure of Hemo-globin.
134. Describe the roll of Hemoglobin in biological system.
135. Write short note on Myoglobin.
136. Write the structure of Chlorophyll.
137. Provide name of biggest side chain and their structure in Chlorophyll
138. Provide the structure of Chlorophyll-a and Chlorophyll-b.
139. Discuss the roll of Chlorophyll in photo-synthesis. (Z)
140. What is importance of Magnesium in Chlorophyll?
141. Give only reactions for photo-synthesis.
142. Provide the name and their symbols of any three toxic elements for human kind.
143. Discuss toxic effect of Arsenic.
144. Explain toxic effect of Lead.
145. Describe toxic effect of Cadmium.
146. What is the toxic effect of Mercury.
147. Give reasons : Noble gases having mono-atomic structure.
148. Provide the electronic configuration of Xenon and Redon.
149. In Clathrates , give specific name for crystal ,structure with cavities and the atoms entrapped in it.

150. Kr85 and Xe133 Clathrates are useful as source of which radiation ?
151. Give the structure of first real compound of noble gas, and what is their colours?
152. Which two noble gas elements makes a number of compounds?
153. Which electron acceptor elements makes compounds with Xenon and Krypton.
154. Provides the name and structure of two Xenon compound which have powerful fluorinating property.
155. How many o-bond and n-bond present in $Xe0_2F_2$ and $Xe0_3$ molecules ?
156. What is the hybridization and shapes of XeF6 and Xe0F4 molecules?
157. Provide the structure of XeFB, XeOF2 and KrF2.
158. Which gas mixture is used instead of air, in modern sea diving apparatus, why?
159. Write short note on Clathrates of noble gases.
160. Give the name, symbol and electronic configuration of noble gases.
161. Provide preparation of
    (i) XeF_2 (ii) XeF_6 (iii) $Xe0F_4$ (iv) $Xe0_3$
162. Prove the structure bases on VSEPR:
    (i) XeF_2 (ii) XeF_6 (iii) $Xe0F_4$ (iv) $Xe02F_2$ (v) $Xe0_4$
163. Provide the uses of Neon.
164. Give the uses of Argon.
165. What are the applications of Krypton and Xenon?
166. Describe the chemical properties of
    (i) $XeOF_4$ (ii) XeO_2F_2
167. State the first law of thermodynamics in as many ways as possible. Obtain the mathematical expression.
168. Show thermodynamically that for an ideal gas CP - Cv = R.
169. Derive the relationship AH = AU + An RT
170. Explain heat capacity at constant volume thermodynamically.
171. Distinguish between isothermal and adiabatic process.
172. What are state functions? How do these differ from path functions?
173. Describe open, closed and isolated systems.
174. What do you understand by the terms : Extensive properties and Intensive properties. Give two examples of each category.
175. Give two definitions of First law of thermodynamics.
176. Under what conditions AU = AH for a chemical reaction?
177. Distinguish between open, closed and isolated system. Give examples.
178. Differentiate between reversible and irreversible processes.
179. Prove that the value of Joule Thomson coefficient is zero for an ideal gas.
180. Write short notes on following
    (1) Enthalpy (ii) Internal Energy (iii) Heat (iv) Work
181. Distinguish between :
    a) Isothermal and adiabatic process
    b) Reversible and Irreversible process
182. Define heat capacity at constant pressure and heat capacity at constant volume.
183. Write notes on Applications and limitations of Thermodynamics.
184. Show that in an isothermal expansion of an ideal gas, AU = 0 & AH = 0.
185. Calculate Work obtained during Adiabatic reversible Expansion.
186. Give Importance and limitations of zeroth law of thermodynamics.

187. Explain flame and Explosion temperature.

Question for five marks

188. Give the classification of organometallic compounds based on Hantacity and M-C bond.
189. Explain preparation and applications of organo-lithium compounds.
190. Describe preparation and applications of organo-mag-nesium compounds.
191. Discuss preparation, structure, and bonding in Ferrocene.
192. Explain Preparation, structure and bonding in Trimethyl aluminium.
193. Explain Preparation, structure and bonding in Zeises salt.
194. Discuss the structure of Hemoglobin.
195. Discuss about structure of Hernoglogin and their importance.
196. Describe the structure and roll of Chlorophyll.
197. Write short note on Chlorophyll and Hemoglobin.
198. Explain about metalo-porphyrin and Iro
199. Explain toxic effects on human of any two toxic metals.
200. Provides the electronic configuration of noble gases and describe occurrence of it.
201. Explain preparation and structure based on VSEPR:
(i) XeF_2 (ii) XeF_4 (iii) $XeOF_4$ (iv) XeO_5
202. Explain structure and properties of (i)$Xe0F_4$ (ii) XeO_2F_2 (iii) KrF_2 (iv) $Xe0_2$
203. Describe the properties of
(i) XeF_2 (ii) XeF_4 XeF_6 (iv) $Xe0_3$ (v) KrF_2
204. Give explanation about the applications of Helium. 6. Explain uses of noble gases.
205. Describe different types of thermodynamic processes.
206. Explain CP and Cv. State their relation.
207. State and explain First law of Thermodynamics.
208. State "Kirchoffs Law" & Derive it.
209. Give the different statement The Zeroth law of Thermodynamics and explain.
210. Give details about State and Path Functions, and differentiate it.
211. Give details about The Joule—Thomson effect and give definition of Joule Thomson inversion temperature.