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Reg. No.

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Second Revision Test - 2023
CHEMISTRY

Time : 3.00 hrs.

Max. Marks : 70

PART - A

Note : i) Answer all the questions. ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer 15 x 1 = 15

- If Avogadro number were changed from 6.022×10^{23} to 6.022×10^{20} , this would change
 - the ratio of chemical species to each other in a balanced equation
 - the ratio of elements to each other in a compound
 - the definition of mass in units of grams
 - the mass of one mole of carbon
- How many orbitals are possible for $n = 4$?
 - 8
 - 10
 - 14
 - 16
- Which of the following pairs of elements exhibit diagonal relationship?
 - Be and Mg
 - Li and Mg
 - Be and B
 - Be and Al
- Mineral source of Lithium
 - Rock salt
 - Spodumene
 - Sylvite
 - none of these
- The name 'Blue John' is given to which of the following compounds?
 - CaH_2
 - CaF_2
 - $\text{Ca}_3(\text{PO}_4)_2$
 - CaO
- Maximum deviation from ideal gas expected from
 - $\text{CH}_4(\text{g})$
 - $\text{NH}_3(\text{g})$
 - $\text{H}_2(\text{g})$
 - $\text{N}_2(\text{g})$
- The temperature of the system decreases in an.....
 - Iso thermal expansion
 - Isothermal compression
 - adiabatic expansion
 - adiabatic compression
- K_c/K_p for the reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ is
 - $1/RT$
 - \sqrt{RT}
 - RT
 - $(RT)^2$
- What is the molality of a 10% w/w aqueous NaOH solution?
 - 2.778
 - 2.5
 - 10
 - 0.4
- The percentage of S-character of the hybrid orbitals in methane, ethane, ethene and ethyne are respectively.
 - 25, 25, 33.5, 50
 - 50, 50, 33.3, 25
 - 50, 25, 33.5, 50
 - 50, 25, 25, 50
- Which of the following shows functional isomerism?
 - ethylene
 - Propane
 - ethanol
 - CH_2Cl_2
- Hyper conjugation is also known as
 - no bond resonance
 - Baker - nathan effect
 - both (a) and (b)
 - none of these
- The general formula for cycle alkanes?
 - C_nH_n
 - C_nH_{2n}
 - $\text{C}_n\text{H}_{2n-2}$
 - $\text{C}_n\text{H}_{2n+2}$
- The name of $\text{C}_2\text{F}_4\text{Cl}_2$ is
 - Freon - 112
 - Freon - 113
 - Freon - 114
 - Freon - 115
- Biochemical oxygen demand value less than 5 PPM indicates a water sample to be
 - highly polluted
 - poor dissolved oxygen
 - rich in dissolved oxygen
 - low COD

PART - II

Answer any six questions. Question No.24 is compulsory

6 x 2 = 12

- Calculate the molar mass of sulphuric acid (H_2SO_4)
- State Heisenberg's uncertainty principal.
- Using Slater rule calculate the effective nuclear charge on 4s electron in Scandium.
- State Graham's law of diffusion.

20. Explain Tautomerism.,
21. What is Sublimation? Give example.
22. Define Gibbs free energy?
23. How is acid rain formed?
24. Which bond is stronger σ (or) π bond? why?

PART - III

Answer any six questions. Question No.33 is compulsory.

6 x 3 = 18

25. State Modern Periodic Law?
26. Mention the uses of Plaster of Paris?
27. Draw the structure of H_2O_2 .
28. Define Hess's law of constant heat summation?
29. State Le-Chatelier's principle.
30. Give three general characteristics of organic compounds.
31. Why chlorination of methane is not possible in dark?
32. Write difference between BOD and COD.
33. A sample of 12M Conc HCl has a density of 1.2 gL^{-1} calculate molality?

PART - IV

Answer all the questions.

5 x 5 = 25

34. a) Balance the following equation using oxidation number method.
 - i) $AS_2S_3 + HNO_3 + H_2O \rightarrow H_2ASO_4 + H_2SO_4 + NO$
 - ii) $FeSO_4 + KMnO_4 + H_2SO_4 \rightarrow Fe_2(SO_4)_3 + MnSO_4 + K_2SO_4 + H_2O$
 b) i) Derive de-broglie equation. 3
 ii) What are isoelectronic ion? Give example?
35. a) A group - I metal (A) which is present in common salt results with (B) to give compound (C) in which hydrogen is present in -1 oxidation state. (B) on reaction with a gas (C) to give universal solvent (D). The compound (D) on react with (A) to give (E), a strong base. Identify A, B, C, D and E a strong base. Identify A, B, C, D and E. **(OR)**
 b) Derive the values of critical constants in terms of Vanderwaals constants.
36. a) i) Write down Born Haber's cycle for formation of $CaCl_2$ 3
 ii) Write K_p and K_c for the following equation $2CO(g) \rightleftharpoons CO_2(g) + C(S)$ 2
(OR)
 b) i) Define molality and normality. 3
 ii) What is "Osmosis"? 2
37. a) i) Draw Mo diagram of Co molecule and calculate its bond order. 3
 ii) Give the hybridization and shape of the CH_4 molecule. 3
(OR)
 b) i) Write short notes on Dow's process and Wurtz reaction. 3
 ii) Explain the preparation of DDT.
38. a) i) Distinguish between Electrophiles and Nucleophiles. 3
 ii) How ozone reacts with 2-methyl propane? 2
(OR)
 b) 0.30 g of a substance gives 0.88 g of carbon dioxide and 0.54 g of water. Calculate the percentage of carbon and hydrogen in it.