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| **University of Kerala** | | |
| Discipline: CHEMISTRY |  | Time: 1 Hour 30 Minutes (90 Mins.) |
| Course Code: UK1DSCCHE104 |  | Total Marks: 42 |
| Course Title: GENERAL INORGANIC CHEMISTRY |  |  |
| Type of Course: DSC |  |  |
| Semester: 1 |  |  |
| Academic Level: 100-199 |  |  |
| Total Credit: 4, Theory: 3 Credit |  |  |

**Part A.**

**6 Marks. Time: 6 Minutes**

**Objective Type. 1 Mark Each. Answer All Questions**

**(Cognitive Level: Remember/Understand)**

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course Outcome (CO)** |
| 1. | Define coordination number. | Remember | CO-4 |
| 2. | Which series in the hydrogen spectrum belongs to the visible region? | Remember | CO-1,2,3 |
| 3. | Write the n/p ratio of stable nuclei | Understand | CO-7 |
| 4. | The number of gram equivalents present in one litre of solution is called …………….. | Understand | CO-5,6 |
| 5. | Write the electron configuration of copper and chromium | Understand | CO-1,2,3 |
| 6. | The quantum number that defines the shape of an orbital is…… | Understand | CO-1,2,3 |

**Part B.**

**8 Marks. Time: 24 Minutes**

**Short Answer. 2 Marks Each. Answer All Questions**

**(Cognitive Level: Understand/Apply)**

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| **Qn.**  **No.** | **Question** | **Cognitive Level** | **Course Outcome (CO)** |
| 7. | Explain using valence bond theory, which is high spin and low spin among [Co(CN)6]3- & [CoF6]3-. | Understand | CO-4 |
| 8. | Explain how the size of cations and anions influences the ionic or covalent character of a bond according to Fajans' Rule. | Understand | CO-1,2,3 |
| 9. | Applying the idea of radioactivity the age of rocks can be determined? | Apply | CO-7 |
| 10. | How would you prepare a 1N sodium hydroxide (NaOH) solution in 250 ml of water? Calculate the mass of NaOH required and weight per litre of solution prepared? | Apply | CO-5,6 |

**Part C.**

**28 Marks. Time: 60 Minutes**

**Long Answer. 7 marks each.**

**Answer all 4 Questions, choosing among options within each question.**

**(Cognitive Level: Understand/Apply/Analyze)**

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| **Qn. No.** | **Question** | **Cognitive Level** | **Course Outcome (CO)** |
| 11. | a. Interpret the crystal field splitting of d orbitals in [Co(NH3)6]3+ and (CuCl4)2-.  OR  b. Illustrate the postulates of VBT and explain the geometry of [Ni(CO)4] using VBT. | Understand | CO-4 |
| 12. | a. Explain VSEPR theory and apply it to predict the shape and geometry of XeF2 and XeF4.  OR  b. Apply the concept of Born-Haber cycle for the formation of sodium chloride (NaCl) and explain how the lattice energy can be calculated. | Apply | CO-1,2,3 |
| 13. | a. Explore in detail, the applications of radioactivity across any four fields.  OR  b. What is group displacement law? How many α and β particles are emitted when 90Th232 changes to 82Pb208. | Apply | CO-7 |
| 14. | a. Analyze the different acid- base titration curves.  OR  b. Illustrate the principle of colorimetry. Analyze how colorimetry can be used in the estimation of glucose. | Analyze | CO-5,6 |