PUNJAB PUBLIC SERVICE COMMISSION
COMBINED COMPETITIVE EXAMINATION (CCE) SYLLABUS

CHEMISTRY

Total Marks: 100

Topics

1. **Physical Chemistry:** Quantum theory, The Schrödinger wave equation, Quantum Numbers, Eigen values and eigen functions, First Law of thermodynamic and Enthalpy changes, Entropy and second law of thermodynamics, Debye-Huckel theory and its applications for strong electrolytes, Electrodes, electrode potential, and its measurement.
2. **Organic Chemistry:** Inductive effect, delocalized chemical bonding and the resonance effect, tautomerism, hyper-conjugation, steric effect and hydrogen bonding, Preparation and properties of catalyzed aldol condensation carbonyl group, Acid and base reactions and nucleophilic additions to the carbonyl group, Stereoisomerism, conformational analysis of cycloalkanes, chirality and optical activity.
3. **Inorganic Chemistry:** Valence bond theory, Hybridization of orbitals, Molecular Orbital theory, Shapes of inorganic molecules, Applications of the VSEPR theory, General Characteristics of d-block elements, Transition metal complexes, structure of coordinate complex compounds, postulates and applications of Werner's Chelates, Nomenclature and isomerism in coordinate compounds.
4. **Analytical Chemistry:** Fundamentals of chemometrics, Principle of UV-visible and IR spectroscopy, bathochromic shift, hypsochromic shift, Instrumentation and working of UV-Visible and IR Spectrophotometers, Principle and types of chromatography. Thin-layer and column chromatography with their applications.
5. **Biochemistry:** Introduction, classification, structure, and metabolism of carbohydrates. Primary, secondary, and Tertiary structure of proteins, lipids, and vitamins.
6. **Environmental Chemistry:** Environmental Pollution, Greenhouse effect, Air Pollution, Water Pollution and Chemical Toxicology, Renewable Energy Resources
7. **Industrial Chemistry:** Sulphuric acid, chemical fertilizers, cement, and ceramics, Soda ash and caustic soda, Detergents, Pesticides, Cosmetics and Pigments
8. **Nuclear Chemistry:** Radioactivity, its detection, and its measurement, kinetics of radioactive decay, Nuclear Fission, Nuclear Fusion, Artificial Radioactivity, uses of radioactive isotopes and nuclear reactors

Suggested readings:

1. Atkins, P., de Paula, J. & Keeler, J. Atkins' Physical Chemistry, 11th ed.
2. Essential of Physical Chemistry by G.D. Tuli, Arun Bahl
3. Morrison, R.T., Boyd, R.N. & Bhattacharjee, S.K. Organic Chemistry, 7th ed.
4. Mechanism and Structure of Organic Chemistry by Gould, Edward.

5. Lee, J.D. Concise Inorganic Chemistry, 6th ed.

6. Advanced Inorganic Chemistry by Cotton F.A. & Wilkinson Geoffrey, 3rd Edition.

7. Selected topics in Inorganic Chemistry by G.D. Tuli.

8. Harris, D.C. & Lucy, C.A. Quantitative Chemical Analysis, 11th ed.

9. Skoog, D.A., Holler, F.J. & Crouch, S.R. Principles of Instrumental Analysis, 7th ed.

10. Nelson, D.L., Cox, M.M. & Hoskins, A.A. Lehninger Principles of Biochemistry, 8th ed.

11. Manahan, S.E. Environmental Chemistry, 11th ed.

12. Sharma, B.K. Industrial Chemistry.

13. Friedlander, G., Kennedy, J.W., Macias, E.S. & Miller, J.M. Nuclear and Radiochemistry, 3rd ed.

14. Arnikar, H.J. Essentials of Nuclear Chemistry, 4th ed.

Note: **The above list is only suggestive and not exhaustive. Candidates may consult other standard books and relevant material covering the prescribed syllabus.**

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