JAI HIND COLLEGE (AUTONOMOUS) Admission to Master of Science (M.Sc.) in Chemistry

Entrance Examination:

Syllabus:

The entrance examination will be based on basic undergraduate chemistry syllabus of FY, SY & TY B.Sc. courses of the program. The broad topics included are as follows:

Physical Chemistry: Atomic & Molecular Structure, Theory of Gases, Solid State, Chemical Thermodynamics, Chemical & Phase Equilibria, Electrochemistry, Kinetics, Adsorption, Spectroscopy

Inorganic Chemistry: Periodic table, Chemical Bonding, Main group elements, Transition & Inner Transition metals, Coordination Chemistry, Bioinorganic Chemistry, Non-aqueous Chemistry

Organic Chemistry: Basic concepts in Organic Chemistry including stereoelectronic effects, Stereochemistry, Spectroscopy of Organic compounds, Organic Reaction Mechanism, Synthetic applications, Name reactions, Qualitative Organic Analysis, Natural Products, Aromatic & Heterocyclic Chemistry

Analytical Chemistry: Classical methods of analysis, Instrumental methods of analysis, Chemical calculations, Separation techniques

Examination pattern:

- 1. The entrance exam will be conducted remotely & will be proctored by the exam committee of the college.
- 2. Candidates will be sent their login credentials & the URL of the web portal to access the exam to their registered email ids.
- 3. Candidates must take the test using a device with camera & must give requisite permissions for remote proctoring.

- 4. Use of unfair means like impersonation, appearance of multiple persons on screen, use of headphones during exam, screen minimizations will lead to outright disqualification of the candidate.
- 5. All matters concerning examination will be at the sole discretion of the PG exam committee of Jai Hind College Autonomous.
- 6. The entrance exam will comprise of 60 multiple choice questions of 1 mark each. There will be a negative marking of 0.25 marks for every wrong answer. Candidates will get 60 minutes to complete the exam after which it will be auto submitted.
- 7. All communication regarding the entrance examination, login credentials, mock tests etc. will be sent to the registered email ids of the candidates only.

Sample Questions from Previous year papers:

- 1. For a reaction to be spontaneous, which of the following criteria must be met?
 - a) $\Delta G = 0$
 - b) $\Delta G > 0$
 - c) $\Delta G < 0$
 - d) $\Delta G = 1$
- 2. Which of the following metal ions is precipitated as its sulfide in an acidic medium in qualitative analysis?
 - a) Cu^{2+}
 - b) Ni²⁺
 - c) Co²⁺
 - d) Zn²⁺
- 3. Which of the following carbocations is the most stable?
 - a) CH₃⁺
 - b) CH₃-CH₂⁺
 - c) $(CH_3)_3C^+$
 - d) $(CH_3)_2CH^+$
- 4. In gravimetric analysis, digestion process is also called
 - a) Ostwald's ripening
 - b) Co-precipitation
 - c) Post-precipitation
 - d) Flocculation
- 5. ABAB... type of arrangement is found in
 - a) Cubic close packing
 - b) Hexagonal close packing

- c) Body centered close packing
- d) Prismatic close packing
- 6. In which of the following heterocycles, the lone pair of electrons is not involved in aromatic sextet?
 - a) Pyrrole
 - <mark>b) Pyridine</mark>
 - c) Furan
 - d) Thiophene
- 7. A plane of symmetry which is perpendicular to the principal axis is called
 - a) Vertical plane
 - b) Dihedral plane
 - c) Horizontal plane
 - d) Perpendicular plane
- 8. The intermediate formed in a Wittig reaction is
 - a) Ylide
 - b) Carbocation
 - c) Enamine
 - d) Ketene
- 9. The value of CFSE for a tetrahedral complex with d^3 configuration is
 - a) 0.6 Δ_t
 - b) $-1.2 \Delta_t$
 - c) $-0.8 \Delta_t$
 - d) $0.2 \Delta_t$
- 10. The typical IR stretching frequency for -OH group is _____ cm⁻¹
 - a) 1500
 - b) 2300
 - c) 1700
 - d) 3400