Unit XI: Alcohols, Phenols and Ethers 9 Periods

**Alcohols:** Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration.

**Phenols:** Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.

**Ethers:** Nomenclature, methods of preparation, physical and chemical properties, uses.

Unit XII: Aldehydes, Ketones and Carboxylic Acids 10 Periods

**Aldehydes and Ketones:** Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.

**Carboxylic Acids:** Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII: Amines 7 Periods

**Amines:** Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

Unit XIV: Biomolecules 8 Periods

**Carbohydrates** - Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration

**Proteins** - Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins.

**Nucleic Acids:** DNA and RNA.

**PRACTICALS**

<table>
<thead>
<tr>
<th>Evaluation Scheme for Examination</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Volumetric Analysis</td>
<td>08</td>
</tr>
<tr>
<td>Salt Analysis</td>
<td>08</td>
</tr>
<tr>
<td>Content Based Experiment</td>
<td>06</td>
</tr>
<tr>
<td>Project Work</td>
<td>04</td>
</tr>
<tr>
<td>Class record and viva</td>
<td>04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
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</tbody>
</table>

**PRACTICAL SYLLABUS** 36 Periods

Micro-chemical methods are available for several of the practical experiments. Wherever possible, such techniques should be used.
A. Chromatography
   i) Separation of pigments from extracts of leaves and flowers by paper chromatography and
determination of Rf values.
   ii) Separation of constituents present in an inorganic mixture containing two cations only
(constituents having large difference in Rf values to be provided).

A. Preparation of Inorganic Compounds
   Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum.
   Preparation of Potassium Ferric Oxalate.

B. Tests for the functional groups present in organic compounds:
   Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.

C. Characteristic tests of carbohydrates, fats and proteins in pure samples and their
detection in given foodstuffs.

D. Determination of concentration/ molarity of KMnO₄ solution by titrating it against a standard
solution of:
   i) Oxalic acid,
   ii) Ferrous Ammonium Sulphate
       (Students will be required to prepare standard solutions by weighing themselves).

E. Qualitative analysis
   Determination of one cation and one anion in a given salt.
   Cation: Pb²⁺, Cu²⁺, As³⁺, Al³⁺, Fe³⁺, Mn²⁺, Zn²⁺, Cu²⁺, Ni²⁺, Ca²⁺, Sr²⁺, Ba²⁺, Mg²⁺, NH₄⁺
   Anions: (CO₃)²⁻, S²⁻, (SO₃)²⁻, (NO₂)⁻, (SO₄)²⁻, C₂H₃COO⁻, Br⁻, I⁻, PO₃⁻, (C₂H₄O)₂⁻, CH₃COO⁻, NO₃⁻
   (Note: Insoluble salts excluded)

PROJECT

Scientific investigations involving laboratory testing and collecting information from other sources

A few suggested Projects.

- Study of the presence of oxalate ions in guava fruit at different stages of ripening.
- Study of quantity of casein present in different samples of milk.
- Preparation of soybean milk and its comparison with the natural milk with respect to curd
  formation, effect of temperature, etc.
- Study of the effect of Potassium Bisulphate as food preservative under various conditions
  (temperature, concentration, time, etc.)
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- Comparative study of the rate of fermentation of following materials: wheat flour, gram flour,
  potato juice, carrot juice, etc.
- Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom).
- Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chilli powder and pepper.

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the
approval of the teacher.
Practical Examination for Visually Impaired Students of Classes XI and XII
Evaluation Scheme

Time Allowed: Two hours
Max. Marks: 30

<table>
<thead>
<tr>
<th>Category</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Identification/Familiarity with the apparatus</td>
<td>5</td>
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<tr>
<td>Written test (based on given/prescribed practicals)</td>
<td>10</td>
</tr>
<tr>
<td>Practical Record</td>
<td>5</td>
</tr>
<tr>
<td>Viva</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

General Guidelines
- The practical examination will be of two hour duration.
- A separate list of ten experiments is included here.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes duration.

- The question paper given to the students should be legibly typed. It should contain a total of 15 practical skill based very short answer type questions. A student would be required to answer any 10 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question papers should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record at least five of the listed experiments as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus required, simple theory, procedure, related practical skills, precautions etc.
- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory/principle/concept, apparatus/materials/chemicals required, procedure, precautions, sources of error etc.

A. Items for Identification/Familiarity of the apparatus for assessment in practical (All experiments)

Beaker, glass rod, tripod stand, wire gauze, Bunsen burner, Whatman filter paper, gas jar, capillary tube, pestle and mortar, test tubes, tongs, test tube holder, test tube stand, burette, pipette, conical flask, standard flask, clamp stand, funnel, filter paper

Hands-on Assessment
- Identification/familiarity with the apparatus
- Odour detection in qualitative analysis

B. List of Practicals

The experiments have been divided into two sections: Section A and Section B. The experiments mentioned in Section B are mandatory.
SECTION- A

A Chromatography
(1) Separation of pigments from extracts of leaves and flowers by paper chromatography and
determination of Rf values (distance values may be provided).

B Tests for the functional groups present in organic compounds:
(1) Alcoholic and Carboxylic groups.
(2) Aldehydic and Ketonic

C Characteristic tests of carbohydrates and proteins in the given foodstuffs.

D Preparation of Inorganic Compounds- Potash Alum

SECTION-B (Mandatory)

E Quantitative analysis
(1) (a) Preparation of the standard solution of Oxalic acid of a given volume
(b) Determination of molarity of KMnO₄ solution by titrating it against a standard solution
    of Oxalic acid.
(2) The above exercise [F 1 (a) and (b)] to be conducted using Ferrous ammonium sulphate
    (Mohr’s salt)

F Qualitative analysis:
(1) Determination of one cation and one anion in a
given salt. Cation –NH₄⁺
    Anions – CO₃²⁻, S₂⁻, SO₄²⁻, Cl⁻, CH₃COO⁻
    (Note: Insoluble salts excluded)

Note: The above practicals may be carried out in an experiential manner rather than recording
observations.

Prescribed Books:
1. Chemistry Part -I, Class-XII, Published by NCERT.
   2. Chemistry Part -II, Class-XII, Published by NCERT.