Government of Karnataka

# Department of Pre University Education

18th Cross, Malleshwaram, Bangalore

## II PUC CHEMISTRY

## Experiments to be conducted for the Academic year 2023-24

| Experiment No. | Experiments | Hours |
|---|---|---|
| 1. | To determine the concentration / molarity of $KMnO_4$ solution by titrating it against 0.1 M standard solution of ferrous ammonium sulphate. | 2 Hrs |
| 2. | To determine the concentration / molarity of potassium permanganate solution by titrating it against 0.1 M standard solution of oxalic acid | 2 Hrs |
| 3. | Systematic qualitative analysis of simple inorganic salt<br>(General procedure to be explained and recorded) | 2 Hrs |
| 4. | Systematic qualitative analysis of simple inorganic salt 1 and 2 | 2 Hrs |
| 5. | Systematic qualitative analysis of simple inorganic salt 3 and 4 | 2 Hrs |
| 6. | Systematic qualitative analysis of simple inorganic salt 5 and 6 | 2 Hrs |
| 7. | Systematic qualitative analysis of simple inorganic salt 7 and 8 | 2 Hrs |
| 8. | Systematic qualitative analysis of simple inorganic salt 9 and 10 | 2 Hrs |
| 9. | Tests for functional groups in organic compounds | 2 Hrs |
| 10. | Effect of concentration on rate of reaction between sodium thiosulphate and hydrochloric acid | 2 Hrs |
| 11. | Effect of temperature on rate of reaction between sodium thiosulphate and hydrochloric acid | 2 Hrs |
| 12. | Determination of enthalpy of solution of $KNO_3$ or $CuSO_4$ | 2 Hrs |
| 13. | Determination of enthalpy of neutralization of HCl and NaOH | 2 Hrs |
| 14. | Determination of enthalpy change on mixing chloroform and acetone | 2 Hrs |
| 15. | To study the variation in cell potential of the cell $Zn \mid Zn^{2+} \parallel Cu^{2+} \mid Cu$ with change in concentration of electrolytes ($CuSO_4$ / $ZnSO_4$) at room temperature | 2 Hrs |
| 16. | Separation of pigments present in leaves and flowers by paper chromatography and determination of $R_f$ values of components | 2 Hrs |
| 17. | Separation of constituents of a mixture of inorganic components containing two cations $Pb^{2+}$ and $Cd^{2+}$ using chromatographic technique | 2 Hrs |
| 18. | Preparation of Ferrous ammonium sulphate crystals (Mohr's salt) | 2 Hrs |
| 19. | Preparation of potash alum | 2 Hrs |
| 20. | Preparation of dibenzal acetone (Dibenzylidene acetone) | 2 Hrs |
| 21. | Preparation of p-nitroacetanilide from acetanilide | 2 Hrs |
| 22. | Preparation of phenyl azo β-naphthol (an azo dye) | 2 Hrs |

# PART –A

## Experiments to be conducted for practical examination

Time: 2 Hrs Total Marks: 30

| | | |
|---|---|---|
| **Q-I** | **Salt analysis**<br>Analyse the given simple inorganic salt systematically and report one **acid radical** and one **basic radical.** | 10 marks |
| **Q-II** | **Titration (Voumetric Analysis)**<br>Estimate the Molarity of $KMnO_4$ solution using given standard (0.1M) **FAS** solution. (procedure of the titration should be given). | 10 marks |
| **Q-III** | **Viva on tests for functional groups in organic compounds:** | 4 marks |
| **IV** | Submission of the duly completed and certified **record** (22 Experiments) | 6 marks |
| | **TOTAL** | **30 marks** |

a) The **following salts** are suggested to be given for analysis for practical examination: **$NH_4Br$, $NH_4Cl$, $Al_2(SO_4)_3$, $MnSO_4$, $ZnSO_4/ZnCO_3$ $CaCO_3$, $BaCl_2$/ $Ba(NO_3)_2$, $Sr(NO_3)_2$/ $SrCl_2$, $MgSO_4/MgCO_3$.**

b) For viva, the questions to be asked based on the following tests.

| Functional group | Tests |
|---|---|
| Alcohol | Ceric ammonium nitrate test and Lucas test |
| Phenol | Neutral ferric chloride and phthalein fusion - test |
| Aldehydes and ket ones | 2,4 – DNP test and Tollen's reagent test |
| Carboxylic acid | Litmus test, sodium bicarbonate test, esterification test |
| Primary amine | Carbylamine test, azo dye test |

# SCHEME OF VALUATION

**Time: 2 Hrs** **Total Marks: 30**

<table>
<tr><td>Q-I</td><td>
Salt analysis (10 Marks)<br>
(i) Preliminary tests (any two correct) 1 mark<br>
(ii) Detection of Acid radical ( 4 Marks)<br>
Group detection<br>
(correct group identification – 1 mark<br>
Correct radical identification – 1 mark) 2 marks<br>
Confirmatory test 2 marks<br>
(iii) Detection of Basic radical (4 Marks)<br>
Group detection<br>
(correct group identification – 1 mark<br>
Correct radical identification – 1 mark) 2 marks<br>
Confirmatory test 2 marks<br>
For writing systematic procedure with absence of previous groups 1 mark
</td><td>10</td></tr>
<tr><td>Q-II</td><td>
Titration (10 Marks)<br>
(i) For performing the experiment 3 marks<br>
For recording the readings in the tabular column 1 mark<br>
(ii) For accuracy of the Titre value 3 marks<br>
upto ± 0.3 mL error 3 marks<br>
± 0.4 mL error 2 marks<br>
± 0.5 mL 1 mark<br>
≤ 0.6 mL & above 0 mark<br>
(iii) Calculations of Molarity (2 marks)<br>
a. Formula 1 mark<br>
b. Substitution and answer with unit (1 + 1) 2 marks
</td><td>10 marks</td></tr>
<tr><td>Q-III</td><td>Viva on functional group in organic compound ( 2 marks)<br>Four questions, two each on any two functional groups (1 × 4)</td><td>4 marks</td></tr>
<tr><td>IV</td><td>Record<br>Submission of the duly completed and certified record</td><td>6 marks</td></tr>
<tr><td></td><td>
<table>
<tr><th>Sl. No.</th><th>% of experiments performed and recorded</th><th>Maximum marks to be awarded</th></tr>
<tr><td>1</td><td>All 22 Experiments</td><td>6</td></tr>
<tr><td>2</td><td>Less than 22 and more than 18 Experiments</td><td>5</td></tr>
<tr><td>3</td><td>Less than 18 and more than 14 Experiments</td><td>4</td></tr>
<tr><td></td><td>Less than 14 and more than 10 Experiments</td><td>3</td></tr>
<tr><td>4</td><td>Less than 10 Experiments</td><td>2</td></tr>
</table>
Total
</td><td>30 marks</td></tr>
</table>