**ANNEXURE**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

**N-SCHEME**

(Implements from the Academic year 2019-2020 onwards)

Course Name : All branches of Diploma in Engineering and Technology and Special Programmes except DMOP, HMCT and film & TV.

Subject Code : **40027**

Semester : I Semester

Subject Title : **ENGINEERING CHEMISTRY – II PRACTICAL**

**TEACHING AND SCHEME OF EXAMINATION**

Number of weeks per semester: 15 weeks

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Subject | Instructions | | Examination | | | |
| ENGINEERING CHEMISTRY-II PRACTICAL | Hours / Week | Hours / Semester | Marks | | | Duration |
| 2 Hrs. | 30 Hrs. | Internal Assessment | Board Examination | Total |
| 25 | 100 | 100 | 3 Hrs. |

**Intellectual Skills**

1. Study the effect of heating on substances and reagents
2. Study of the reactions of the following radicals leading to qualitative analysis of the given Inorganic simple salt soluble in water or dilute acids
3. Study the harmful effects of effluents

**Motor Skills**

1. Handling the apparatus carefully

2. Awareness on Industrial safety

**40027 - ENGINEERING CHEMISTRY – II PRACTICAL**

CONTENTS

**Part I: Analysis of Inorganic simple salt (QUALITATIVE ANALYSIS)**

* Analysis of eight inorganic simple salts containing any one acid radical and basic radical without omitting any of the below mentioned radicals.

**Acid Radicals** : Carbonate, Chloride, Nitrate and Sulphate

**Basic Radicals** : Lead, Copper, Aluminium, Ferrous, Zinc, Barium, Calcium, Magnesium and Ammonium

**Part II: Analysis of Effluent containing Lead, Copper and Zinc metal ions (EFFLUENT ANALYSIS)**

* Analysis of three effluents, each containing the above mentioned metal ions. Report on the metallic pollutant with procedure (Basic Radical Analysis Procedure) and their harmful effects.

Note:

**Every student should be provided the separate location with the following minimum apparatus required in a batch.**

|  |  |  |
| --- | --- | --- |
| **Sl.No.** | **Name of the Item** | **Quantity (Nos.)** |
| 1 | Funnel | 1 |
| 2 | Glass Rod | 1 |
| 3 | Test Tubes (15 x 1.5 mm) | 4 |
| 4 | Test Tubes (15 x 1.5 mm) | 1 |
| 5 | Test Tube cleaning Brush | 1 |
| 6 | Test Tube Holder | 1 |
| 7 | Test Tube Stand | 1 |
| 8 | Wash Bottle | 1 |

**40027 - ENGINEERING CHEMISTRY – II PRACTICAL**

**BOARD EXAMINATION**

**Note:**

1. Individual apparatus / equipment should be provided for the batch strength.
2. All the students should be given same question and each batch of student should be given different inorganic simple salt and effluent. (Eight salt and three effluents).
3. All the experiments must be given in all the batches.
4. The external examiner should verify the availability of the apparatus / equipment for the batch strength before the commencement of Practical Examination.
5. Properly evaluated record note book should be submitted for the Board Practical Examination.

##### **DETAILED ALLOCATION OF MARKS**

###### **Board Practical Examination: 100 Marks**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Part – A: Analysis of Simple Salt | 62 |
| Part – B: Analysis of Effluent | 32 |
| Viva-Voce | 06 |
| **Total Marks** | **100** |

**Guide lines for Evaluation**

**Qualitative Analysis:**

|  |  |
| --- | --- |
| **FOR** | **MARKS** |
| Identification Procedure of Acid Radical with Systematic | 31 |
| Identification Procedure of Basic Radical with Systematic | 31 |

|  |  |
| --- | --- |
| Identification of Acid Radical with confirmatory test | 13 |
| Identification of Basic Radical with confirmatory test | 13 |
| Mere Spotting of Acid Radical and Basic Radical (4+4) | 08 |

**Effluent Analysis:**

|  |  |
| --- | --- |
| **FOR** | **MARKS** |
| Identification of metallic pollutant  procedure with systematic | 26 |
| Harmful effects of metallic pollutant | 06 |

|  |  |
| --- | --- |
| Group Identification Tests of metallic pollutant | 13 |
| Confirmatory Test of metallic pollutant | 13 |
| Mere Spotting of the pollutant | 04 |

###### **Internal Assessment: 25 Marks**

|  |  |
| --- | --- |
| **Content** | **Mark Allotted** |
| Observation | 10 |
| Record | 10 |
| Attendance | 5 |
| **Total Marks** | **25** |

**MODEL QUESTION PAPER**

**Note:**

1. **All the students should be given two parts (Qualitative Analysis and Effluent Analysis).**
2. **Different inorganic simple salt and effluent. (Eight salt and three effluents) should be given for each batch.**

Part I:

Analyse the given Inorganic simple salt and report the acid radical and basic radical present in it.

Part II:

Analyse the given sample of effluent and report the metallic pollutant present in it with procedure and its harmful effects.

**40027 - ENGINEERING CHEMISTRY – II PRACTICAL**

LIST OF APPARATUS / EQUIPMENT REQUIRED (Batch strength:30 Students)

Infrastructure and Equipment required

|  |  |  |
| --- | --- | --- |
| **Sl.No.** | **Name of the Item** | **Quantity (Nos.)** |
| 1 | LPG Connection for 30 students | |
| 2 | Working Table with all accessories for 30 students | |
| 3 | Exhaust Fan (High Capacity) | Sufficient Nos. |
| 4 | Fire Extinguisher | 1 |
| 5 | First Aid Box (Full Set) | 2 |
| 6 | Safety Chart | 1 |
| 7 | Chemical Balance | 1 |
| 8 | Fractional Weight Box | 1 |
| 9 | pH Meter | 5 |

Glassware and Other Items

|  |  |  |
| --- | --- | --- |
| **Sl.No.** | **Name of the Item** | **Quantity (Nos.)** |
| 1 | Burette (50 ml) | 35 |
| 2 | Burette Stand | 35 |
| 3 | Pipette (20 ml) (With safety Bulb) | 35 |
| 4 | Pipette (10 ml) | 5 |
| 5 | Conical Flask (250 ml) | 35 |
| 6 | Funnel (3”) | 50 |
| 7 | Porcelain Tile | 35 |
| 8 | Measuring Cylinder (10 ml) | 5 |
| 9 | Measuring Cylinder (1000 ml) | 2 |
| 10 | Reagent Bottle (White) (250 ml) | 60 |
| 11 | Reagent Bottle (White) (125 ml) | 100 |
| 12 | Reagent Bottle (Amber) (250 ml) | 80 |
| 13 | Test Tube (15 mm x 1.5 mm) | 1000 |
| 14 | Test Tube (15 mm x 2.5 mm) | 500 |
| 15 | Test Tube Stand | 35 |
| 16 | Test Tube Holder | 35 |
| 17 | Test Tube cleaning brush | 35 |
| 18 | Glass Trough | 5 |
| 19 | Beaker (100 ml)` | 35 |
| 20 | Glass Rod (15 cm) | 100 |
| 21 | Watch Glass (3”) | 35 |
| 22 | Wash Bottle (Polythene) | 35 |
| 23 | Nickel Spatula | 35 |
| 24 | Bunsen Burner for Gas connection | 35 |
| 25 | Plastic Bucket (15 L) | 10 |
| 26 | Filter Papers (Round) | Sufficient Nos. |
| 27 | Standard Flask (100 ml) | 35 |