**Semester – I CHEMISTRY UNIT I & IV Syllabus**

**2015 - 16**

**Paper –I (CHE101) 60 Hrs**

**UNIT – I Inorganic Chemistry 15 hrs**

**1. s-block elements:** General characteristics of groups I & II element, **2 hr**

Diagonal relationship

**(Assignment - CIA**)

**2. p-block elements: 13 hrs**

General characteristics of elements of groups 13, 14, 15, 16 and 17

**Group – 13**: Synthesis and structure of diborane and higher boranes (B4H10 and B5H9),

boron-nitrogen compounds (B3N3H6 and BN) caluculation of types of bonds in higher boranes.

**Group – 14:** Graphitic compounds , Silanes, Silicones - Preparation, Properties and uses

**Group – 15 :** Phosphonitrilic compounds

**Group-16**: Classification of oxides based on (i) Chemical behavior and (ii) Oxygen content.

**Group-17**: Inter halogen compounds- Classification, preparation and properties. Pseudo halogens, similarities and dissimilarities with halogens, Polyhalides.

**UNIT-IV (Analytical Chemistry) 15 hrs**

**1-General Principles of Inorganic qualitative analysis 5 hrs**

Characteristic reactions of anions, elimination of interfering anions, Solubility product, common ion effect, separation of cations into groups, group reagents, testing of cations .

**2.Theory of quantitative analysis**:, **6 hrs**

Classification. Theories of acid base titrations, Choice of indicators, Redox titrations, Indicators in  Redox titrations. Dichrometric, permanganometric and iodometric titrations, Complexometric titrations, Indicators and Precipitation titrations, Indicators.

**3.Evaluation of analytical data:** **4hrs**

Theory of errors-significant figures- Accuracy and Precision expressing it and methods of expression- Minimization of errors, standard deviation and confidence limit.

**Semester – I CHEMISTRY UNIT I & IV Lecture wise Schedule**

**2015 - 16**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Month** | **No. of Classes** | **Lecture no.** | **Topic** | **UNIT** | **Remarks** |
| **July** | **8** |  | Introduction |  |  |
|  | **s-block elements** : General characteristics – Trends in At. Radi, Ionisation potential, Electropositive nature | **UNIT I** | **Assignment**  **CIA – 3**  **10 marks** |
|  | Metallic nature, Basicity, Electron affinity, Electronegativity, Diagonal relationship |
|  | **General Principles of Inorganic qualitative analysis -** characteristic reactions of anions | **UNIT IV** | **Smart board** |
|  | elimination of interfering anions |
|  | Solubility product, common ion effect |
|  | separation of cations into groups, group reagents |
|  | separation of cations into groups, group reagents |
| **August** | **7** |  | **p-block elements:** General characteristics of elements of groups 13, 14, 15, 16 and 17 | **UNIT I** |  |
|  | **Group – 13**: Synthesis and structure of diborane | **Smart board** |
|  | Synthesis and structure of higher boranes (B4H10 and B5H9), Caluculation of types of bonds in higher boranes |
|  | Boron-nitrogen compounds (B3N3H6 and BN) |
|  | **Group – 14 :**Graphitic compounds |
|  | Silanes, Silicones-- Preparation, Properties and uses |
|  | **Group – 15 :**Phosphonitrilic compounds |
| **September** | **7** |  | **Group – 16 :**Classification of oxides based on (i) Chemical behavior |
|  | Classification of oxides based  (ii) Oxygen content |
|  | **Group – 17 :**Pseudo halogens similarities and dissimilarities with halogens. |
|  | Polyhalides. |
|  | **Theory of quantitative analysis** - Theories of acid base titrations, Indicators | **UNIT IV** | **Smart board** |
|  | Theories of acid base titrations |
|  | Redox titrations, Indicators in  Redox titrations. |
| **October** | **6** |  | Redox titrations- . Dichrometric, permanganometric |  |  |
|  | Redox titrations - iodometric titrations |  |
|  |  |  | Complexometric titrations , Indicators |  |
|  | Precipitation titrations. Indicators |  |
|  | **Theory of errors**-significant figures- | **UNIT IV** | **Smart board** |
|  | Accuracy and Precision expressing it and methods of expression |
| **November** | **2** |  | Minimization of errors |
|  | standard deviation and confidence limit |

**Department of Chemistry**

**End Semester Examination**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **End Semester Evaluation** | **Duration** | **Max. Marks** | **Mention whether Unit wise Internal choice / overall choice** | | | **Total** |
| **Number of questions with marks allotted** | | |
| **Long answer** | **Short answer** | **Very short answers.** |
| **ESE** | **2 hrs** | **35** | **4X5=20**  **With internal choice.** | **4X2=8**  **With internal choice.** | **7X1=7**  **Open choice(7 out of 10)** | **35** |

**Lab work Evaluation details**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CIA** | | | **End Semester Exam** | | |
| **Attendance** | **Experiment** | **Total** | **Experiment** | **Viva** | **Total** |
| **5** | **10** | **15** | **30** | **5** | **35** |

**Semester I**

**DEPARTMENT OF CHEMISTRY**

ESE (Semester-I)

Chemistry Practical Paper-I **CHE111**

**Scheme of Valuation**

**Q. 1** Analyse the given mixture using semi-micro qualitative technique systematically and report only **Two Anions** present in it. 30 marks

1. Solubility - 4 marks
2. Flame Test - 2 marks
3. 2 anions - 2 x 10 = 20 marks
   1. Group identification – 2
   2. Two confirmatory tests – 4x2 = 8

Total 10 x 2 = 20

1. Result - 4 marks ( Name and formula )
2. **2**  Viva - 5 marks

**ESE-Model Question paper**

**B.Sc. I-SEMESTER EXAMINATION, OCTOBER/NOVEMBER-2015**

**CHEMISTRY 101**

**Time: 2 Hours (Max. Marks:35)**

**Note: Answer all questions**

**SECTION-A (4X5=20)**

1. Write the structures with examples of different types of interhalogen compounds.

OR

Explain the periodic properties of Alkali and Alkaline earth metals .

2. What is Inductive effect. Explain the stability of carbocations based on Inductive effect

OR

Write any three methods for the preparation of alkenes

3. Derive the relationship between critical constants and Vander Waal’s constants

OR

Derive the expression for energy of a particle in a one dimensional box.

4. Define common ion effect. Explain how it is useful in the separation of Cu+2 from Zn+2 in qualitayive analysis.

OR

How is acid base indicator selected in acid-base titrimetric analysis?

**SECTION-B (4X2=8)**

5. Discuss the structure of Diborane.

OR

Write a note on uses of silicones.

6. State the law of corresponding states..

OR

Define Tc,Vc,Pc

7. Illustrate Bond fissions with examples

OR

Give any one reaction to generate carbanion

8. Define metallochromes

OR

Define accuracy and Precision.

**SECTION-C**

**Answer any seven from the following (7X1=7)**

1. Write the structure of Borazole
2. What are graphitic compounds?
3. What is Mohr’s titration?
4. What is wurtz reaction?
5. Give example for electrophiles & nucleophile
6. What is mesomorphic state?
7. What is well behaved unction?
8. What is the compressibility factor of an ideal gas?
9. What is an Indicator?
10. What is meant by a redox reaction?