III B. Sc - SEMESTER- V: INDUSTRIAL CHEMISTRY SYLLABUS
THEORY PAPER – V
Paper-V: CHEMICAL PROCESS INDUSTRIES
Total hours of teaching 60 hrs @ 3 hrs per week

UNIT - I **12hrs**

OILS FATS AND SOAPS: Distinguish between oils and fats- classification and properties of oils and facts - manufacture of cotton seed oil by expression method and manufacture of soybean oil by solvent extraction method - refining of vegetable oils - hydrogenation of oils - analysis of oils - acid value - saponification value - iodine value - aniline point.

UNIT – II **12hrs**

SOAPS AND DETERGENTS: Manufacture of soap by cold process and dry process – cleansing action of soap

Detergents: principle groups of detergents – biodegradability of surfactants – anionic detergents – cationic detergents – non-ionic detergents – amphortric detergents – manufacture of shampoos.

UNIT III **12hrs**

OXIDATION : types of Oxidations – oxidation reactions – kinetics and mechanism of oxidation of organic compounds – commercial manufacture of benzoic acid, meleic anhydride, pthallic anhydride

ZNIC: Occurrence – extraction – electrolytic method of extraction – galvanizing

UNIT IV: **12hrs**

METALLURGY: classification of ores – general principal of metallurgy – purification of metals.

EXTRACTION OF ORES: Commercial forms of ion – effects of impurities and properties of cast iron – description of blast furnace - manufacture of pig iron – blast furnace slag – modern trends in blast furnace practices

UNIT V **12hrs**

STEEL: Manufacture of steel by Bessemer process and open-hearth process – classification of steel – mechanical treatment of steel – Ferro alloys.

ALLOYS: Purpose of making alloys – light alloys – copper alloys – nickel alloys – low melting alloys – methods of preparation of alloys – heat treatment of alloys.

Books for Reference:

Text Book : industrial Chemistry (including Chemical Engineering)by B.K.Sharma, Goel Publishing house, Meerut.

III B. Sc – INDUSTRIAL CHEMISTRY SYLLABUS SEMESTER- V
Practical Paper-V: CHEMICAL PROCESS INDUSTRIES
Total hours of teaching 30hrs @ 2hrs per week

1. Acid value of vegetable oils
2. Saponfication value of vegetable oils.
3. Iodine value of vegetable oils.
4. estimation of % Iron in carbon steel
5. aniline point of oils
6. Estimation of % MnO_2 present in pyrosulate.
7. Estimation of Cu present in Brass sample.

Practical examination pattern : practical 40marks,Recors +viva=10marks

Books Recommended:

1. Quantitative Inorganic analysis by A.I.Vogel.
2. Instrumentation methods of Chemical Analysis by Ewing
3. Vogel's text book of Quantitative Chemical Analysis by G.H. Jeffery, J. Bassett, J.Mendham, R.C.Denny

III B. Sc – SEMESTER- V, INDUSTRIAL CHEMISTRY MODEL PAPER

PAPER-V: Chemical Process Industries

Time: 3 hours Maximum Marks: 75

PART - A

Answer any Five questions **5 X 5 = 25**

1. Write the properties of Oils and Fats?
2. Write a short note on refining of Oils?
3. Write a short note on cleansing action of soap?
4. Explain the manufacture of shampoos?
5. Write briefly on Solvent extraction method?
6. Write a short notes on Galvanization ?
7. Explain the industrial preparation of Phthalic anhydride?
8. Write about copper alloys?

PART -B

Answer All Questions **5 X 10 = 50**

9. Explain the manufacture of soyabean oil by solvent extraction? OR
   Explain the analysis of oils and fats?
10. Explain the manufacture of soap by continuous process? OR
    Explain the manufacturing process of Anionic detergents?
11. Explain the types of Oxidation reactions? OR
    Explain the manufacture of Zinc by Electrolytic process?
12. Explain briefly on general principles of Metallurgy? OR
    Explain the manufacture of Pig Iron?
13. Explain the manufacture of Steel by Bassemer Process ? OR
    Explain about Light alloys?

III B. Sc - SEMESTER- V: INDUSTRIAL CHEMISTRY THEORY SYLLABUS

PAPER-VI: UNIT PROCESS IN ORGANIC SYNTHESIS

Total hours of teaching 60 hrs @ 3 hrs per week

UNIT – I **12 hrs**

SULPHONATION: Sulphonating agents – mechanism of sulphonation – batch Vs continuous sulphonation – commercial sulphonation of benzene, naphthalene, alkyl benzene

UNIT – II **12 hrs**

NITRATION: Nitrating agents – kinetic and mechanism of aromatic nitration – batch Vs continuous nitration – nitration of benzene, nitrobenzene, chlorobenzene, acetanilide, and toluene

UNIT III: **12 hrs**

HYDROGENATION: Catalysts for hydrogenation reaction – manufacture of methanol from CO and H2 – hydrogenation of acids and esters to alcohol, catalytic reforming.

UNIT IV: **12 hrs**

HALOGENATION: Reagents for halogenations – chlorination in side chain and nucleus of aromatic compounds – commercial manufacture of monochromic acetic acid, monochloro benzene – chloral, DDT, BHC, Freon

UNIT – V **12 hrs**

ALKYLATION: Types of alkylation's – alkylating agents – mechanism of alkylation – manufacture of linear alkyl benzene – alkylate for petroleum industry – manufacture of tetra ethyl lead.

Books for Reference:

1. Unit Process in Organic Synthesis by P.H.GROGGINS, Tata McGraw-Hill Book Company, Inc

III B. Sc - SEMESTER- V: INDUSTRIAL CHEMISTRY PRACTICAL
PRACTICAL PAPER-VI: UNIT PROCESS IN ORGANIC SYNTHESIS

Total hours of teaching 30 hrs @ 3 hrs per week

1. Preparation of m-Dinitro benzene from nitro Benzene
2. .Preparation of p- nitro Acetanilide from Acetanilide.
3. Preparation of Acetanilide from PAC-sulphine amide
4. chemical analysis alloys (brass, bonze solder and steel
5. Electro chemical analysis of alloys(brass and bronze)
6. 2,4-Dinitro toluene from p-nitro toluene
7. preparation of DDT

Practical examination pattern : practical 40marks,Recors +viva=10marks

Books Recommended:

1. Quantitative Inorganic analysis by A.I.Vogel.
2. Instrumentation methods of Chemical Analysis by Ewing
3. Vogel's text book of Quantitative Chemical Analysis by G.H. Jeffery, J. Bassett, J.Mendham, R.C.Denny

III B. Sc - SEMESTER- VI: INDUSTRIAL CHEMISTRY MODEL PAPER

PAPER–VI: Unit Process in Organic Synthesis

Time: 3 hours Maximum Marks: 75

PART - A

Answer any Five questions **5 X 5 = 25**

1. Explain the commercial sulphonation of Benzene?
2. Write about sulphonating agents?
3. Write about Nitrating agents?
4. Write about the nitration of Toluene?
5. Explain the hydrogenation of Acid and Esters to alcohol?
6. Explain the industrial preparation of Chloral ?
7. Explain the chlorination of side chain aromatic compounds?
8. Write the preparation of TEL?

PART -B

Answer All Questions **5 X 10 = 50**

9. Explain the kinetics and mechanism of aromatic Nitration ? OR
   Explain about Batch Vs Continuous Nitration ?
10. Explain about the Batch Vs Continuous Sulphonationi? OR
    Explain the commercial sulphonation fo Naphthalene ?
11. Write briefly on catalysts for Hydrogenation Reactions ? OR
    Explain about catalytic Reforming?
12. Write briefly on Halogenations Reactions? OR
    Explain the preparation of DDT and BHC?
13. Explain the mechanism of liquid phase alkylation ? OR
    Write about alkylating agents?