Andhra Pradesh State Council of Higher Education

I B.Sc - SEMESTER- I: INDUSTRIAL CHEMISTRY SYLLABUS

w.e.f. 2015-16 (Revised in April, 2016)

Paper- I CHEMICAL PROCESS INDUSTRIES-1

Total hours of teaching 60hrs @ 4 hrs per week

Dr.B.R.AMBEDKAR UNIVERSITY, SRIKAKULAM

(CBCS UG Proposed Syllabus)

Subject: Industrial Chemistry

I B.Sc - SEMESTER- I: INDUSTRIAL CHEMISTRY SYLLABUS

w.e.f. 2020-21

Paper- I CHEMICAL PROCESS INDUSTRIES-1

Total hours of teaching 60hrs @ 4 hrs per week

UNIT- I **12h**

Water Treatment: - Source of water, quality of natural water, water quality parameters, hardness of water causes, conditions of water, permutit, ion-exchange process, treatment of water for municipal purpose, desalting of sea water, composition, properties and quality of deposits in boilers and heat exchangers, treatment of boiler water, corrosion and treatment of heat power equipments, industrial water treatment, water analysis, BOD, COD, determination of hardness.

Sewage and Sewage treatment: - Municipal waste water, sewage and its compositions, aerobic process and anaerobic processes for the treatment of sewage bacteria, methods of sewage treatment – aerobic oxidation plants.

Industrial wastes and treatment process:- Types of industrial wastes, nature, effect and treatment of chemical wastes from some important industries.

UNIT- II 12h

Corrosion:- Introduction, economic aspects of corrosion, types of corrosion chemical corrosion and electrochemical corrosion, theories of chemical corrosion and electrochemical corrosion, factors effecting chemical corrosion, atmospheric corrosion, water corrosion, microbiological corrosion, prevention of corrosion.

Protective coating :- Introduction, types of metal coating, coating processes, galvanizing, tinning, metal cladding, electroplating, immersion plating, cementation, metal spraying.

UNIT – III **12h**

Glass: :- Rawmaterials, methods of manufacture (pot furnace, tanks furnace, regenerative tank furnace), shaping, various glasses- coloured glass, safety glass, fibre glass, pyrex glass, photosensitive glass, glass wool.

Ceramics:- Introduction and properties of ceramics, basic raw materials, formation, types and properties of clay, manufacturing processes, glazing, porcelain, China ware- raw materials and manufacture.

Cement:- Types of cements, raw materials, manufacture of cement dry, wet processes, setting of cement, properties of cement, physico – chemical principles involved , fuel burning devises – mortar and concrete.

UNIT- IV **12h**

Paints:- Classification, manufacture of paints, emulsion paints, heat resistant paints, varnishes, enamels, solvents and thinners.

Paper and pulp:- manufacture of various pulps, beating, refining, filling, sizing and colouring, manufacture of paper and calendaring.

UNIT – V 12 h

Plastics:- Introduction, classification and properties of plastics, condensation polymerisation, addition polymerisation, cross linked polymerisation, co-polymerisation, raw materials for plastic industries, moulding of plastics, Bakelite, poly ethylene, polystyrene, cellulose nitrate, cellulose acetate, urea formaldehyde resin, PVC.

Rubber:- Types of rubber, drawbacks of raw rubber, vulcanization of rubber, synthetic rubbers, Buna –s rubber, neoprene rubber, butyl rubber, polyurethane rubber, sponge rubber, foam rubber, rubber cement, thermocole, application of rubber.

Books for Reference:

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

I B.Sc – SEMESTER –I: INDUSTRIAL CHEMISTRY PRACTICAL SYLLABUS

Paper-I: CHEMICAL PROCESS INDUSTRIES-1

Total hours of laboratory Exercises 30 hrs @ 2 per week

---

1. Total soluble solids in a given sample of water.
2. Estimation of total chlorides and sulphates.
3. Preparation of potassium hydrogen phthalate and standardization of NaOH.
4. Preparation of standard potassium dichromate and standardization of Ferrous ammonium sulphate and estimation of Fe2+ and Fe3+ in a given mixture.
5. Prerparation of standard oxalic solution and standardization of potassium permanganate and estimation of Fe2+ in a given solution.
6. Estimation of temporary hardness, permanannent hardness and total hardness.
7. Analysis of cement.
8. Analysis of Lime (dolomite)
9. Estimation of chemical oxygen demand (COD).

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

Text Book : A Text Book on Experiments and Calculation in Engineering Chemistry by S.S.Dara, S. Chand & Company Ltd, Ram nagar, New Delhi.

B.Sc - SEMESTER –I
INDUSTRIAL CHEMISTRY MOODEL PAPER –I
Paper-1 : CHEMICAL PROCESS INDUSTRIES

Time: 3hrs. Max.
Marks: 75

PART - A
Answer any Five questions **5 X 5 = 25**

1. Briefly explain the determination of hardness of water?
2. Describe the sewage composition?
3. Explain the economic aspects of corrosion?
4. Explain the types of Industrial Wastes?
5. Write a short note on glazes?
6. Explain setting of cement?
7. Write short notes on addition polymerization?
8. Write short notes on thermocoal and its application?

PART -B
Answer All Questions **5 X 10 = 50**

9. Explain the treatment of hard water by Ion-exchange process? OR
   Explain about Aerobic oxidation plants?
10. Explain the factors effecting chemical corossion? OR
    Explain the following 1. Galvanizing 2. Electroplating?
11. Explain briefly manufacture of Ceramics? OR
    Explain the manufacture of Glass?
12. Explain the manufacturing process of paints. ? OR
    Explain the manufacture of Paper ?
13. Explain the manufacturing process of phenolformaldehyde resin? OR
    Explain the manufacture of Buna – S Rubber?