Vidyalankar

F.E. : Sem. II

Applied Chemistry II

Syllabus

Time : 2 Hrs.

Theory : 75 Marks

Term work : 25 Marks

1. **Corrosion :**
   - Nernst theory, Standard Electrode potential, Types of corrosion Dry or chemical corrosion wet or electrochemical corrosion, Electrochemical, Galvanic Cell, Concentration cell, Intergranular Stress cell corrosion, Polarization, Over voltage. Factors affecting rate of corrosion.
   - Methods to decrease the rate of corrosion, Cathodic and Anodic Protection, Cathodic and Anodic coatings. Advanced coatings and protection methods. Only constituents and their function of : (a) Paints, (b) Varnishes , (c) Lacquors, (d) Enamels.
   - Metallic Coatings : Methods of coating and study only electroplating method. Corrosion Engineering of electronic and photonic devices.

2. **Alloys :**
   - Alloys, Types of alloys, Alloys of Al, Cu and Pb. Their composition properties and uses. Recent advances in alloy related materials.
   - Powder Metallurgy. Methods of metal powder formation, Metal Ceramic powders. Technology of Powder metallurgy. Applications of powder metallurgy.

3. **Fuel :**
   - Definition, Classification, Characteristic properties of a good fuel. Calorific value, Cross and Net calorific value, Conversion. Peoximate and altimate analysis of fuels, Combustion calculations for requirement of oxygen and air for given solid, liquids gaseous fuel.
   - Liquids Fuels : Crude Petroleum oil, classification. Separation and purification of Gasoline from crude oil. Thermal cracking, Catalytic cracking, Fixed bed, moving method for obtaining gasoline.
   - Diesel, Bio diesel, methods to obtain bio diesel, production of ethanol using bio-mass, Production of hydrocarbons from plants, Knocking, Octane value, Cetane Value, Antiknocking agents and their function recent technology for catalytic converter.

4. **Composite Materials :**
   - Introduction, Constitution, Characteristic properties classification. Particle, fiber, reinforced composites structural composites.
   - Application of composite matrials.

5. **Green Chemistry :**
   - Introduction, Goals Significance, Basic ideas in the field of green chemistry research with 3 examples.
   - Industrial applications of green chemistry

6. **Catalysis :**
    - Introduction, Importance of catalysts and adsorbents in industry, Activation energy and catalysis.
    - Molecular design for catalysts and adsorbents, Molecular design by nature–zeolites, zeotypes, pillard clays, Metal complexes and clusters, Oxide materials carbon materials, membranes.

Recommended Books :

- Engineering Chemistry (*Jain & Jain*) Dhanpat Rai.
- Basic Inorganic Chemistry (*Cotlon*) Wiley India, 3rd edition.
- Engineering Chemistry (*Dara & Dara*) S Chand
- Materials Science & Engineering (*William Callister*).
- Chemsitry of advanced materials (*CNR Rao*) RSC Publications.
- Membrane Filtration (*Gutman*) Adam Hilger Bristol.
- Physical Metallurgy (*B. K. Agarwal*)

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