SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road, Puttur – 517583
QUESTION BANK

Subject with Code : Engineering Chemistry (19HS0802)   **Course & Branch**:B.Tech (CE & ME)
Year & Sem: I-B.Tech & II-Sem   **Regulation :** R19

UNIT-1

WATER TECHNOLOGY

1. a) What are the specifications of the drinking water BIS and WHO Standards.   [6M]
    b) What are the units to express hardness of water?   [6M]

2. Describe the estimation of hardness by EDTA method.   [12M]

3. a) How water gets hardness. Distinguish between hard water and soft water?   [4M]
   b) Explain in detail about Boiler corrosion.   [8M]

4. a) Explain the importance of priming ang foaming?   [6M]
   b) Explain sludge and Scale formation in boilers ?   [6M]

5. Briefly   Explain about the boiler troubles and their treatment?   [12M]

6. Describe the Zeolite or permutit process for softening of water. what are the
    advantages and disadvantages of zeolite process.   [12M]

7. Describe the Ion exchange process for demineralization of water ?what are the
    advantages and disadvantages of ion exchange process ?   [12M]

8. a) Explain about demineralization of brakish water by Reverse Osmosis .   [6M]
   b)Explain about demineralization of brakish water by Electrodialysis.   [6M]

9. Explain in detail about the Industrial water treatment .   [12M]

10. Explain with a neat sketch the various steps involved in municipal solid waste water   [12M]
     Treatment .

UNIT-II

ELECTROCHEMISTRY AND APPLICATIONS

1. a) What is Electrochemical cell ? Give an example. [7M]

    b) Calculate the single electrode potential of zinc in 0.05M $ZnSO_4$ solution at 25^0C.

    $E^0{}_{Zn/Zn}{}^{2+}$ = 0.763V. [5M]

2. Define Electrode Potential. Derive the Nernst equation for a single electrode potential [12M]
    and write its applications.

3. a)What is primary Battery ? Write a note on Li battery (Primary Cell) . [5M]
    b) Explain the Construction and working of Lead acid battery. [7M]

4. a)What is secondary Battery ? Write a note on Lithium Ion rechargeable cell. [6M]
    b) Describe the Construction and Working of Methanol – Oxygen Fuel cell. [6M]

5. What is a Fuel cell ? Describe the Construction and Working of
    Hydrogen – Oxygen Fuel Cell. [12M]

6. Discuss in detail about electrochemical or wet corrosion? [12M]

7. Define corrosion ? Discuss in detail about chemical or dry corrosion . [12M]

8. a)Write a note on sacrificial anodic protection? [6M]
    b) Define the importance of the   Impressed Current Cathodic protection ? [6M]

9. a) What is electroplating ? Explain electroplating of Nickel and copper ? [6M]
    b) What is Differential Aeration cell corrosion ? Give the suitable Examples. [6M]

10. Explain various factors influencing the rate of corrosion ? [12M]

UNIT-III

POLYMERS AND FUEL CHEMISTRY

1. a) What is functionality of monomer?   [5M]
      b) Write a note on nomenclature of polymers.   [7M]

2. Explain the following mechanism
      a) Free radical addition polymerization.   [6M]
      b) Cationic addition polymerization.   [6M]

3. Explain the following mechanism
      a) Anionic addition polymerization.   [6M]
      b) Co-ordination or Ziegler-Natta polymerization.   [6M]

4. Write the preparation, properties and application of Buna-S rubber ,
      Buna-N rubber and Thikol rubber.   [12M]

5. a) Distinguish between Thermoplastics and thermosetting plastics.   [4M]
      b) Describe the preparation, properties and uses of Bakelite.and PVC   [8M]

6. a) what are the fuels, the classification and examples of the fuels. ? write their units. [8M]
      b) Calculate the gross and net calorific values of coal having the following
      composition , Carbon = 85% ,Hydrogen = 8% ,Sulphur = 1% , nitrogen= 2%
      Ash= 4 %, Latent heat of steam = 587 cal/gm.   [4M]

7. Explain the analysis of Coal (Proximate and Ultimate) With its Significance.   [12M]

8. Describe the method employed for the refining of petroleum with neat sketch   [12M]

9. a)What are significance of the Fuels for IC Engines   [6M]
   b) Write a note on Octane value and Cetane value   [6M]

10. a)What is the essential of propane and methanol fuel.   [6M]
      b) What is the importance of the Ethanol and Bio fuel ?   [6M]
.

UNIT –IV
BASIC ENGINEERING MATERIALS

1. What is meant by composites ? Classify the composites materials. [12M]

2. What are Refractories ? How are they Classified .Discuss in detailed about properties of Refractories. [12M]

3. Define Viscosity? Determine the viscosity of lubricating oil by Redwood Viscometer . [12M]

4. Write short notes on:
   a) Flash and Fire point [6M]
   b)Cloud and Pour point [6M]

5. Discuss the mechanism of different types of lubrication. [12M]

6. Define the lubricants give the classification and examples of the lubricants ? [12M]

7. Define Cement .Explain in detailed about manufacture of Portland Cement? [12M]

8. a)What is cement ? How do you classify the cement ? [6M]

   b)Explain in detail about setting and hardening of portland cement? [6M]

9. What are the applications of Composite materials ? [12M]

10. a)Write a note on Fiber reinforced materials. [7M]
   b)What are the properties of composite material [5M]

UNIT –V

SURFACE CHEMISTRY AND APPLICATIONS

1.Write any two methods synthesis of colloids with suitable examples. [12M]

2.What is the significance of the adsorption isotherm [12M]

3.Explain various methods of stabilization of colloids. [12M]

4.a)What is colloid ? Classify the colloids based on the physical state. [6M]
   b)Write a note on Micelle formation [6M]

5. Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM) [12M]

6. Discuss the principle, instrumentation and applications of Transmission electron microscopy(TEM) [12M]

7. Explain principle, instrumentation and applications X-ray diffraction [12M]

8. a) Explain   the BET Equation [7M]
   b)What are the factors influencing Adsorption of gases on solids [5M]

9.Write a brief note on Applications of Colloids and Nano materials. [12M]

10.What are the Characterization of surface by Physicochemical method ? [12M]