SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road, Puttur – 517583
QUESTION BANK (DESCRIPTIVE)

Subject with Code : Engineering Chemistry (20HS0804) **Course & Branch**: B.Tech – CE& AGE
Regulation : R20 **Year & Sem:** I-B.Tech & II SEM

UNIT-1

WATER TECHNOLOGY

1. Describe the estimation of hardness by EDTA method . [L3][CO1][12M]

2. a) What is priming and foaming ? [L1][CO1] [6M]

   b) Explain the process of scale and sludge formation in boilers. [L2][CO1] [6M]

3 a) How water gets hardness. Distinguish between hard water and soft water? [L4][CO1] [4M]
   b) Explain in detail about Boiler corrosion. [L2][CO1] [8M]

4 a) What are the specifications of the drinking water BIS and WHO Standards. [L1][CO1] [6M]
   b) What are the units to express hardness of water? [L1][CO1] [6M]

5. Briefly explain about the boiler troubles and their treatment? [L2][CO1] [12M]

6. Describe the Zeolite or permutit process for softening of water. what are the advantages and disadvantages of zeolite process. [L3][CO1] [12M]

7. Describe the Ion exchange process for demineralization of water ?what are the advantages and disadvantages of ion exchange process ? [L3][CO1] [12M]

8. a) Explain about demineralization of brackish water by Reverse Osmosis . [L2][CO1] [6M]
   b)Explain about demineralization of brackish water by Electrodialysis. [L2][CO1] [6M]

9. How do you estimate dissolved oxygen in water is determined by Winkler's method. [L4][CO1] [12M]

10. Explain with a neat sketch the various steps involved in municipal solid waste water Treatment . [L2][CO1] [12M]

UNIT-II

ELECTROCHEMISTRY AND APPLICATIONS

1. a) What is Electrochemical cell ? Give an example. [L1][CO2] [7M]

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

   $E^0_{Zn/Zn^{2+}} = 0.763V$. [L3][CO2] [5M]

2. Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications. [L1][CO2][12M]

3. a)What is primary Battery ? Write a note on Zinc-air battery . [L1][CO2] [6M]
   b) Explain the Construction and working of Lead acid battery. [L2][CO2] [6M]

4. a)What is secondary Battery ? Write a note on Lithium Ion rechargeable cell. [L1][CO2] [6M]
   b) Describe the Construction and Working of Methanol – Oxygen Fuel cell. [L3][CO2] [6M]

5. What is a Fuel cell ? Describe the Construction and Working of Hydrogen – Oxygen Fuel Cell. [L3][CO2][12M]

6. Discuss in detail about electrochemical or wet corrosion? [L3] [CO2][12M]

7. Define corrosion? Discuss in detail about chemical or dry corrosion . [L3][CO2] [12M]

8. a)Write a note on sacrificial anodic protection? [L1][CO2] [6M]
   b) Define the importance of the Impressed Current Cathodic protection ? [L1][CO2] [6M]

9. a) What is electroplating ? Explain electroplating of Nickel and copper ? [L2][CO2] [6M]
   b) What is Differential Aeration cell corrosion ? Give the suitable Examples. [L1][CO2] [6M]

10. Explain various factors influencing the rate of corrosion ? [L3][CO2] [12M]

UNIT-III

POLYMERS AND FUEL CHEMISTRY

1. a) What is functionality of monomer? [L1][CO3] [5M]
   b) Write a note on nomenclature of polymers. [L1][CO3] [7M]

2. What is polymerization ? Explain different types of polymerization with examples. [L1][CO3] [12M]

3. Explain the mechanism of addition polymerization. [L2][CO3] [12M]

4. Write the preparation, properties and application of Buna-S rubber , Buna-N rubber and Thikol rubber. [L2][CO3] [12M]

5. a) Distinguish between Thermoplastics and thermosetting plastics. [L4][CO3] [4M]
   b) Describe the preparation, properties and uses of Bakelite.and PVC [L3][C03] [8M]

6. a) what are the fuels? Give their classification with examples. write their units. [L1][CO3] [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. [L3][CO3] [4M]

7. Explain the analysis of Coal (Proximate and Ultimate) With its Significance. [L2][CO3] [12M]

8. Describe the method employed for the refining of petroleum with neat sketch [L3][CO3] [12M]

9. a)What are significance of the Fuels for IC Engines [L1][CO3] [6M]
   b) Write a note on Octane value and Cetane value [L1][CO3] [6M]

10. a)What is the essential of propane and methanol fuel. [L1][CO3] [6M]
    b) What is the importance of the Ethanol and Bio fuel ? [L1][CO3] [6M]

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UNIT –IV
BASIC ENGINEERING MATERIALS

1.What is meant by composites ? Classify the composites materials. [L1][CO4] [12M]

2.What are Refractories ? Write their Classification. .Discuss in detailed about properties of Refractories.[L1][CO4] [12M]

3. Define Viscosity? Determine the viscosity of lubricating oil by Redwood Viscometer . [L2][CO4] [12M]

4. Write short notes on:
   a) Flash and Fire point [L1][CO4] [6M]
   b)Cloud and Pour point [L1][CO4] [6M]

5. Discuss the mechanism of different types of lubrication. [L3][CO4] [12M]

6. What is meant by lubricant ? Give the classification and examples of the lubricants ? [L1][CO4] [12M]

7. Define Cement . Explain in detailed about manufacture of Portland Cement? [L2][CO4] [12M]

8. a)What is cement ? How do you classify the cement ? [L1][CO4] [6M]

   b)Explain in detail about setting and hardening of portland cement? [L2][CO4] [6M]

9. What are the applications of Composite materials ? [L1][CO4] [12M]

10.a)Write a note on Fiber reinforced materials. [L1][CO4] [7M]
   b)What are the properties of composite material [L1][CO4] [5M]

UNIT –V

SURFACE CHEMISTRY AND APPLICATIONS

1.Write any two methods synthesis of colloids with suitable examples. [L1][CO5] [12M]

2.Write a note on any one chemical and electrochemical methods of preparation of nano metals [L1][CO5] [12M]

3. a) Write an account on carbon nano tubes. [L1][CO5] [6M]
b) Write a note on fullerenes. [L1][CO5] [6M]

4.a)What is colloid ? Classify the colloids based on the physical state. [L1][CO5] [6M]
b)Write a note on Micelle formation [L1][CO5] [6M]

5. Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM) [L2][CO5] [12M]

6. Discuss the principle, instrumentation and applications of Transmission electron microscopy(TEM) [L3][CO5] [12M]

7. Explain principle, instrumentation and applications X-ray diffraction [L2][CO5] [12M]

8. a) Explain the BET Equation [L2][CO5] [6M]
b)What are the factors influencing Adsorption of gases on solids [L1][CO5] [6M]

9.Write a brief note on Applications of Colloids and Nano materials. [L1][CO5] [12M]

10.What are the Characterization of surface by Physicochemical method ? [L1][CO5] [12M]