

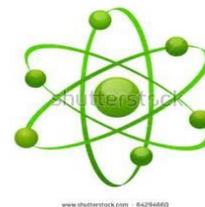


P.E.S. College of Engineering, Mandya – 571401

(An Autonomous Institution under Visvesvaraya Technological University, Belgaum)

Aided by the Govt. of Karnataka

DEPARTMENT OF CHEMISTRY



Date: 10/04/2020

First Assignment

The assignment in Engineering Chemistry for **Second** sem B.E, **A, B, C, D, E & F** section students. The students shall be submitted the same on or before **15th, May, 2020** without fail.

1. What is Nano-Chemistry? Explain the bottom up and top down approach of nano materials.
2. Differentiate between molecules, nano particles and Bulk materials.
3. Write short note on i) nano particles ii) nano rods iii) nano wires and iv) nano tubes.
4. Discuss the synthesis of nano particles by chemical vapor deposition.
5. Mention the properties of nano particles in science and technology as well as medicine.
6. List out the application of nano particles in all fields.
7. What are liquid crystals? Differentiate between lyotropic and thermotropic liquid crystals with example.
8. Explain the applications of liquid crystals in electronic and thermography.
9. Explain the molecular ordering of the following liquid crystals: i) Nematic phase ii) Chiral nematic phase and iii) Smectic phase
10. Distinguish between: smectic, nematic and cholesteric types of liquid crystals with examples.
11. Give an account of chemical properties of liquid crystals.
12. Explain the effect of electric field on liquid crystals.

Second Assignment

1. What is desalination of water? Explain the desalination of sea water by electro – dialysis.
2. With neat diagram, describe the reverse osmosis of saline water.
3. What is water pollution? Describe the sources and ill effects of water pollution.
4. What are boiler scales? Explain the formation and ill effects of boiler scales.
5. Differentiate boiler scale and sludge. Describe the ion exchange process of hard water.
6. Discuss the purification of water for municipal supply.
7. Explain internal treatments for softening of hard water.
8. Describe the ion exchange process of softening of hard water.
9. Describe the determination of total hardness of water by EDTA method.
10. Define COD and BOD. Discuss the treatments of sewage water.
11. A sewage water of 25ml for COD reacts with 25ml of $K_2Cr_2O_7$ solution and the un-reacted $K_2Cr_2O_7$ required 11.5ml of 0.05N FAS solution under similar conditions, in blank titration, 17.5ml of 0.05N of FAS is used up. Calculate the COD of the sample.
12. Calculate the COD of the effluent sample when 25ml of the effluent require 12.5ml of 0.004M of $K_2Cr_2O_7$ solution for complete oxidation (Eq. wt of $K_2Cr_2O_7 = 48$)
13. Explain the process of determination COD of waste water.

**References: Engineering Chemistry by Jain & Jain or M.M. Uppal or Internet
Engineering Chemistry by Wiley, second Edition for nano Chemistry.**

Note: Students are required to keep one copy of assignment with you for the examination.