

**BE (1st Semester)**  
**Examination, Nov-Dec 2006-2007**  
**Applied Chemistry**

UNIT- I

1. (a) Write the chemical reactions with formula for EDTA complexometric titration for determination of hardness and water.

Attempt three questions:

- (i) What do you mean by internal conditioning of boiler feed water?
  - (ii) Explain with chemical reactions involved and quality of lime soda for 1 million liters of water.
- Analysis of raw water is as follows:

Mg<sup>2+</sup> = 48 ppm, Ca<sup>+</sup> = 100 ppm, NaCl = 234 ppm, HCO<sub>3</sub> = 18.3 ppm, H<sup>+</sup> = 15 ppm,  
CO<sub>2</sub> = 44 ppm

(b) What is boiler corrosion? Describe factors responsible for it and removal methods.

(c) What do you mean by alkalinity of water?

UNIT- II

2. What is Calorific Value? Give its experimental determination by Bomb calorimeter. What is Delong's? Formula?

UNIT- III

3. (a) Attempt any three questions:

- (i) What is the difference between high temperature and low temperature carbonization?
- (ii) How efficiency of combustion can be determined experimentally.
- (iii) Explain SIE and CIE. One petrol sample exhibits same knock as mixture of 80% is octane and 20% heptanes. What is octane rating of sample?
- (iv) Analysis of Jharkhand coal sample is as follows:  
C=80%, H=4%, O=5% rest is ash. The flue gas analysis was found (By weight) CO<sub>2</sub>=12%, CO=2.0%, O<sub>2</sub>=8.0%, N<sub>2</sub>=78% Determine the-

- (1) Minimum air required for 1 Kg coal combustion.
- (2) Excess % of air used for 1 Kg coal combustion.

(3) Total air required for combustion of 1 Kg coal sample

(b) Explain Corrosion of iron in presence of acidic medium.

(c) Attempt any three questions:

(i) Why rusting problem is maximum in joints in wire fencing.

(ii) Write the reactions of charging and Discharging process by lead storage battery.

(iii) What are the factors affecting corrosion and its protective measure?

(iv) Why in marine hardware iron bolts are used in copper nut?

Explain setting and hardening of cement.

#### UNIT-V

5. (a) Attempt any three questions:

(i) What is extreme pressure lubrication and what are its additives?

(ii) Compare between thermoplastics and thermosetting polymers.

(iii) Show different stages of Bakelite formation and its uses.

(iv) What are elastomers? What is the importance and mechanism of vulcanization?

(b) What are characteristics of good propellant? Write the classification of Propellant.

(c) Attempt any three questions:

(i) Explain industrial methods of preparation and synthetic use of ammonium chloride.

(ii) Comment on oxygen balance and calculate the value of oxygen balance of TNB.

(iii) What is smokeless powder and gun powder?

(iv) Write flow chart for methods of preparation of ethyl alcohol and melamine.