

PRACTICE PAPER
F.E-I/ APPLIED CHEMISTRY

Date:06/11/2015

(REVISED COURSE)

TOTAL MARKS:60

(2HOURS)

N.B.1. Question no.1 is compulsory.

2. Answer any three questions from the remaining five.

3. All questions carry equal marks.

Q1. Solve any five.

[15]

- (a) Define cloud point and pour point.
- (b) What happens when temporary hard water is boiled? Give equations to explain.
- (c) Give the preparation and uses of silica refractory.
- (d) Distinguish between thermoplastic and thermosetting resins.
- (e) Natural rubber needs to be vulcanized. Give reason for the same.
- (f) What is condensed system? State the condensed phase rule equation.
- (g) Give the principle of estimation of hardness of water using EDTA method (only equations).

Q2. (a) Calculate the quantity of pure lime and soda required for softening 50,000 litres of water

containing the following salts per litre -

$\text{Ca}(\text{HCO}_3)_2=8.1\text{mg}$; $\text{Mg}(\text{HCO}_3)_2=7.3\text{mg}$; $\text{CaSO}_4=13.6\text{mg}$; $\text{MgSO}_4=12.0\text{mg}$; $\text{NaCl}=4.7\text{mg}$;

$\text{MgCl}_2=23.75\text{mg}$;

[6]

(b) Explain the two component Pb-Ag system with an appropriate phase diagram.

[5]

(c) What are the carbon nanotubes? Discuss the CVD method of preparation of CNT. [4]

Q3. (a) What are conditions for the use of solid lubricants? Explain the structure and uses of graphite. [6]

(b) Define moulding and discuss the Injection moulding method of fabrication of plastic.

[5]

(c) Discuss the limitations of phase rule.

[4]

Q4 (a) Give the preparation, properties and uses of (i) PMMA (ii) Buna-S

[6]

(b) Give well balanced equation of the reactions that take place in the lime soda process.

[5]

(c) 3g of vegetable oil was mixed with 50ml of 0.5N KOH solution and heated for 1hours. The mixture required 19ml of 0.5N HCL. The blank titration reading was 49ml. Find the saponification value of the oil sample. [4]

Q5 (a) Discuss the setting and hardening of Portland cement as well as the function of gypsum with balanced equations. [6]

(b) What is moulding? Explain with the help of a neat diagram Extrusion moulding of an insulated cable. [5]

(c) The hardness of 50,000litres of a sample of water was removed by passing it through a zeolite softener. The softener required 200litres of NaCl solution containing 12.5g/L of NaCl for regeneration. Calculate the hardness of sample of water. [4]

Q6. (a) (i) Define and explain the significance of BOD and COD.

(ii) Discuss reverse osmosis. [6]

(b) Discuss any two of the following-

(i) Glass transition temperature.

(ii) polymer in medicine and surgery.

(iii) Conducting polymers. [5]

(c) Write a note on blended oils (any four additives) [4]