

Please check whether you have got the right question paper.

- N.B:
1. Q.No.1 is compulsory.
 2. All questions carry equal marks.
 3. Attempt any three questions from Q.No.2 to Q.No.6.
 4. Figures to the right indicate full marks.
 5. Atomic Weights: Ca=40, Mg=24, H=1, C=12, O=16.

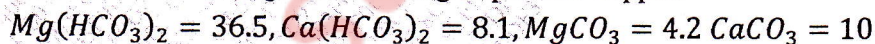
Q.1 Answer any five of the following.

15

- a) Differentiate between temporary hardness and permanent hardness.
- b) What is the function of plasticizer in the compounding of plastic? Give two examples.
- c) What are functions of lubricants?
- d) Explain the reduced phase rule.
- e) List the applications of CNT's.
- f) Distinguish between thermoplastics and thermo setting plastics.
- g) A 10 ml sample of waste water was refluxed with 30ml of $K_2Cr_2O_7$ solution. After refluxing, the excess dichromate required 25 ml of 0.1N FAS solution. 10ml of distilled water under same condition required 35ml of 0.1 N FAS solution. Calculate the COD value of the waste water.

Q.2 a) Calculate lime (80% pure) and soda (90%) required to soften one million litres of hard water containing the following impurities in ppm.

06



b) Discuss the application of phase rule to one component water system.

05

c) Describe the laser method of preparation of CNT.

04

Q.3 a) Discuss the mechanism of boundary film lubrication. Define lubrication.

06

b) What is vulcanization? How does it improve the properties of rubber?

05

c) Discuss the limitations of phase rule.

04

(P.T.O)

- Q.4 a) Give the preparation, properties and uses of 06
i) PMMA ii) Kevlar
- b) With the help of neat and labeled diagram explain demineralization process. 05
- c) Find the saponification value of an oil weighing 3.0g, refluxed with 50 ml of 0.5 N KOH, required 20 ml of 0.5 N HCl for titration. The blank titration reading was 50 ml of 0.5 N HCl. 04
- Q.5 d) 06
a) Write short notes on
1) Decay of concrete
2) RCC 05
- b) Define fabrication. Explain compression moulding with labeled diagram. 05
- c) The hardness of 10,000 liters of water sample was removed by passing it through a zeolite softener. The softener required 400 liters of NaCl solution containing 100 g/l of NaCl for regeneration. Calculate the hardness of the water sample. 04
- Q.6 a) What is activated sludge process? Explain it with flow-sheet diagram. 06
- b) What is glass transition temperature? what is its significance? 05
- c) Write a note on blended oil. 04