

(REVISED COURSE) Q.P. Code : 1020

(2 Hours)

[Total Marks : 60

N.B.: (1) Question No.1 is compulsory.

(2) Answer Any Three questions from the remaining Five questions.

(3) Figures to the right indicate full marks.

(4) All questions carry equal marks.

Atomic weights : Ca = 40, Mg = 24, C = 12, O = 16, H = 1, N = 14, S = 32, Na = 23, Cl = 35.5, Si = 28.

1. Attempt any Five from the following:

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- Differentiate between temporary and permanent hardness.
- Explain Glass transition temperature of polymer and its significance.
- Define lubrication and give functions of lubricant.
- Define Phase, Component and Degree of freedom.
- Write the preparation, properties and uses of Dolomite bricks.
- Give the preparation, properties and uses of Buna-S.
- Calculate all types of hardness of water sample containing:
Ca (HCO₃)₂ = 81 ppm, MgSO₄ = 60 ppm, MgCO₃ = 42 ppm, Ca (NO₃)₂ = 82 ppm.

2. (a) A water sample has the analytical report as under:

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MgCO₃ = 84 ppm, CaCO₃ = 40 ppm, CaCl₂ = 55.5 ppm, Mg (NO₃)₂ = 37 ppm,
KCl = 10 ppm. Calculate lime & soda required for softening 1 litre of water.

(b) State Gibb's phase rule. Give its application to one component system.

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(c) What are refractories ? Give the preparation, properties and uses Carborundum bricks.

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3. (a) Define and give the significance of the following properties of lubricants:

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(i) Flash point.

(ii) Pour point.

(iii) Viscosity Index.

(b) Explain Compeunding of plastics. (five ingredients)

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(c) What is a Condensed phase systems. Draw the phase diagram of an Ag-Pb system with proper labelling.

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4. (a) Write the preparation, properties and applications of Bakelite.

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(b) Write note on Ultra filtration and Reverse osmosis.

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(c) 0.5 g of an oil is saponified with 50 ml of alcoholic KOH solution.

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After refluxing the mixture, it required 22 ml of 0.1 N HCl solution.

Find the Saponification value of given sample.

Q.P. Code : 1020

2

5. (a) Explain manufacturing of Portland cement (wet process) with a labelled diagram of a rotary kiln. 6
- (b) Define Fabrication. Explain Compression moulding with labelled diagram. 5
- (c) A Zeolite softener was regenerated by passing 200 litre of NaCl solution, containing 50g / litre of NaCl. How many litre of water of hardness 50 ppm can be softened by this softener. 4
6. (a) Describe Zeolite method with a labelled diagram. 6
- (b) Give the preparation and applications of any two of the following: 5
- (i) PMMA
- (ii) Kevlar and
- (iii) Silicone rubber.
- (c) Under which conditions use of semi solid lubricants is preferred. 4
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