F.E./Sem-I/ Applied Chemistry-I / Shakti Academy
128 : 1ST HALF-13 (S)-JH

Con. 6907–13. (REVISED COURSE) GS–5220

(2 Hours) [Total Marks : 60

N.B. (1) Question No. **1** is **compulsory**.
(2) Answer any **three** questions from the remaining.
(3) **All** questions carry **equal** marks.

Atomic weight :––

Ca	**=**	**40**	**Mg**	**=**	**24**
H	**=**	**1**	**Cl**	**=**	**35·5**
C	**=**	**12**	**Na**	**=**	**23**
O	**=**	**16**			

1. Solve any **five** :— 15
   (a) Differentiate between BOD and COD.
   (b) What are natural rubbers ? What are their drawbacks ?
   (c) Define grease. Under which situation it is used as a lubricant.
   (d) Define phase, component and degree of freedom.
   (e) Write composition of portland cement.
   (f) What are plasticizer and give its functions ?
   (g) What is the total hardness of sample of water which has the following impurities in mg/l.

$Ca(HCO_3)_2$	=	162	$CaCl_2$	=	22·2
$Mg\ Cl_2$	=	95	NaCl	=	20

2. (a) 0·5g of $CaCO_3$ was dissolved in dilute HCl and diluted to 500 ml. 50 ml of this solution required 45 ml of EDTA solution for titration. 50ml of hard water sample required 15 ml of EDTA solution for titration. 50 ml of same water sample on boiling, filtering requires 10 ml of EDTA solution. Calculate the temporary permenant and total hardness in ppm. 6
   (b) Draw and explain the phase diagram of ice-water-water vapour system. 5
   (c) Explain CVD method for preparation of carbonnanotubes. 4

3. (a) What are solid lubricants explain with two examples. 6
   (b) Explain fabrication of plastic with example of injection molding. 5
   (c) Give limitations of phase rule. 4

4. (a) Write preparation, properties and uses of following polymers :— 6
      (i) Buna S
      (ii) Kevlar
   (b) Explain deminoralization of water by ion exchange method. 5
   (c) 2·5 g of vegetable oil was mixed with 50 ml of KOH solution and heated for 1 hour. The mixture required 26·4 ml of 0·4 N HCl. The blank titration reading was 49·0 ml. Find the saponification value of oil. 4

5. (a) Write preparation properties and uses of – 6
      (i) Dolomite bricks
      (ii) Silicon carbide
   (b) Explain effect of heat on polymers and factors affecting it. 5
   (c) A zeolite softener was completly exhausted and was regenerated by passing 150 lit of NaCl solution, containing 50 g/litre of sodium chloride. How many litres of water sample of hardness 450 ppm can be softened by this zeolite container. 4

6. (a) With the help of chemical equations explain the principle of lime soda process. 6
   (b) Write short notes on :–– 5
      (i) Conducting polymers
      (ii) Polymers in medicine and surgery.
   (c) Explain the following properties and discuss its significance 4
      Viscosity and Viscosity index.

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