Sem-I / B CBCGS / App. Chem-I / Nov-16

27-12-2016

Q.P. Code : 803400

(2 Hours)   [Total Marks : 60

N.B. : (1) Question **No.1** is **Compulsory.**
    (2) Attempt any **3** questions from remaining.
    (3) Figures to the right indicate full marks.
    (4) Atomic weight H=1 , C=12, N=14, O=16, Na=23, Mg=24, S=32, Cl=35.5,Ca =40

1. Answer **any five** from the following :   15
   (a) What is the role of polymers in medicine and surgery ? Explain with the help of any three examples.
   (b) Distinguish between alkaline and non alkaline hardness.
   (c) State the limitations of phase rule.
   (d) What are carbon nanotubes ? Explain different types of carbon nanotubes.
   (e) When would solid lubricants are used ?
   (f) 6 ml of waste water was refluxed with 25 ml of $K_2Cr_2O_7$ solution and after refluxing the excess unreacted dichromate required 20ml of 0.1 N FAS solution . A blank of distilled water on refluxing with 25 ml of $K_2Cr_2O_7$ solution required 35 ml of 0.1N FAS solution. Calculate the COD of waste water sample.

2. (a) Calculate the quantity of pure lime and soda required for softening of 40000   6
   liters of water containing the following impurities
   $Ca(HCO_3)_2$ = 16 ppm , $Mg(HCO_3)_2$ = 7 ppm , $CaSO_4$ =13 ppm , $MgCl_2$= 10 ppm , NaCl = 2 ppm.

   (b) (i) Distinguish between thermoplastics and thermosettings.   3
       (ii) Define flash and fire points.   2

   (c) Write the CVD method for preparation of carbon nanotubes.   4

3. (a) What is meant by fabrication of plastics ? Explain injection moulding with   6
   the help of a neat diagram.

   (b) (i) State the condensed phase rule.   3
       (ii) How is gypsum useful in setting and hardening of cement ?   2

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(c) The hardness of 85000 liters of water sample was removed by passing it through a zeolite softener. The zeolite required 2000 liters of NaCl solution containing 190 mg/lit of NaCl for regeneration. Calculate the hardness of water sample.   4

4. (a) How is activated sludge process carried out for the treatment of waste water ? Explain with flow sheet diagram.   6

   (b) (i) 1.4 gm of oil required 1.8 ml of 0.01 N KOH for neutralization. Calculate the acid value and mention whether the oil is suitable to be used or not.   3

       (ii) Write the applications of fullerenes.   2

   (c) What are the functions of fillers and plastisizers in the compounding of plastics ?   4

5. (a) Write the preparation, properties and uses of PMMA and Buna-S.   6

   (b) (i) What are the advantages of ion exchange process ?   3

       (ii) What is oilness ? What is its importance in lubrications ?   2

   (c) What is the application of phase rule to one component water system ? Explain with the help of phase diagram.   4

6. (a) Define lubricants and lubrication. Discuss the hydrodynamic lubrication in detail.   6

   (b) (i) Define phase, component and degree of freedom.   3

       (ii) What are the industrial applications of ultrafiltration ?   2

   (c) What is RCC ? Write the advantages of it.   4