

FE ALL BRANCHES

Internal Assessment Test-1

Applied Chemistry-I

Date: 11.09.17

Time: 1:30-2:30 pm

Max marks: 15

Note the following instructions.

1. All questions are compulsory.
2. Draw neat diagrams, write reactions wherever necessary.
3. Write everything in ink (no pencil) only.
4. Assume data, if missing, with justification.
5. Atomic Weights Ca = 40, Mg = 24, C = 12, O = 16, Si = 28, Cl = 35.5, S = 32, H = 1, Al = 27, Na = 23, Fe = 56

1. Attempt any 5 questions: [5*1=5]

- a) Hot lime soda process is preferred over cold lime soda process. Justify.
- b) Write the function of Coagulant in cold lime soda process. Give one example of coagulant.
- c) A 20 ml sample of waste water was refluxed with 30 ml of potassium dichromate solution and after refluxing the excess unreacted dichromate required 11 ml of 0.1 N FAS solution. Blank of 20 ml of distilled water on refluxing with 30 ml of dichromate solution required 14 ml of 0.1 N FAS solution. Calculate the COD value of wastewater.
- d) Enumerate the limitations of zeolite method.
- e) Differentiate between temporary and permanent hardness.
- f) Explain the principle of reverse osmosis.
- g) Explain the role of bleaching powder as a disinfectant.

2.a) Explain Demineralization process with the help of diagram. [3]

2.b) 20,000 litres of hard water was treated by an ion exchanger. The cation exchange resin required 300 litres of 0.1 N HCl and anion exchange resin [2]


required 300 litres of 0.1 N NaOH. Calculate hardness of water.

OR

- 2.c) Calculate the quantity of lime(80%) and soda (95%) required for the softening of 5000 liters of water containing $\text{Mg}(\text{HCO}_3)_2 = 144\text{ppm}$, $\text{CaSO}_4 = 136\text{ ppm}$, $\text{CaCO}_3 = 45\text{ppm}$, $\text{HCl} = 40\text{ ppm}$, $\text{Na}_2\text{SO}_4 = 15\text{ppm}$. Write the reactions of lime with the above impurities [3]
- 2.d) Explain Electrodialysis process and write its applications. [2]
- 3.a) A completely exhausted zeolite softener requires 200 liters of 15% NaCl solution. How many liters of water having hardness 400 ppm can be softened by the zeolite? [3]
- 3.b) Explain the principle of EDTA method for determination of hardness. [2]

OR

- 3.c) 0.28g of CaCO_3 was dissolved in HCl and diluted to one litre with distilled water. 100ml of this solution required, 28 ml of EDTA. 50 ml of hard water sample required 20 ml of EDTA. 25 ml of boiled water required 5 ml of EDTA. Calculate each type of hardness. [3]
- 3.d) Briefly write about the activated sludge method. [2]

	St. Francis Institute of Technology (Engg. College) Internal Assessment Test-II Academic Year: 2017-2018	
Branch: FE ALL		Year: FE SEM I
Subject: APPLIED CHEMISTRY I		Time: 2:00-3:00 PM
Date: 16/10/17		No. of Pages: 02
Marks: 15 Marks		

Instructions: Candidates should read carefully the instructions printed on the question paper and on the cover of the Answer Book, which is provided for their use.

Note the following instructions.

6. All questions are compulsory.
7. Draw neat diagrams wherever necessary.
8. Write everything in ink (no pencil) only.
9. Assume data, if missing, with justification.

Q.1.	Attempt any five.	(1*5)
a.	Give any four differences between thermosetting and thermoplastic polymers.	1M
b.	Write the role of 1) Lubricant 2) Plasticizers in compounding of plastics.	1M
c.	Define Glass transition temperature. Write two factors affecting it.	1M
d.	Give the preparation of Plexiglass.	1M
e.	Define tacticity. Write its types.	1M
f.	Write two merits and demerits of phase rule.	1M
g.	Define Eutectic Mixture. Give one example.	1 M
Q.2.	Explain water system and find the degree of freedom for areas, curves and point.	(1+2)M
a.		
b.	Write the conditions for polymer to become conductive in nature, give two examples.	2 M
	OR	
c.	Give preparation, properties and uses of Bakelite.	3M
d.	Define Gibbs phase rule. Find out the degree of freedom of the following system: $\text{CaCO}_3(s) \rightleftharpoons \text{CaO}(s) + \text{CO}_2(g)$	2M

Q.3.a.	List any four drawbacks of natural rubber? Explain vulcanization process with reaction.	3M
b.	What is reduced phase rule? When is it used?	2M
	OR	
c.	Explain with diagram the moulding process used for thermosetting polymers only.	3M
d.	Mention any two characteristics of polymers used in medical field? Give 2 examples with applications.	2M