FE | Sem-2 | Choice Based | AC-2 | 30/05/18

Sub:- Applied Chemistry-1 Q.P. Code : 37759

[Time: 2 Hours] [Marks: 60]

Please check whether you have got the right question paper.

N.B:
1. Question.No.1 is compulsory.
2. Attempt any three questions from the remaining five.
3. All questions carry equal marks.
4. Figures to the right indicate full marks.
5. Atomic weights : H = 1, Mg = 24, Ca = 40, C = 12, O = 16, N = 14, S = 32, Cl = 35.5 , Na = 23

Q.1. Attempt any five from the following :- **15**

a) Discuss the drawbacks of natural Rubber.

b) Explain disinfection of water by addition of bleaching Powder.

c) What are the limitations of Phase Rule?

d) Discuss fullerenes. Give its applications.

e) Write a note on Greases.

f) A 10ml of sample of water was refluxed with 20ml potassium dichromate solution and after refluxing, the excess unreacted dichromate required 26.2ml of 0.1M FAS solution. A blank 10ml of distilled water on refluxing with 20ml of dichromate solution required 36ml of 0.1M FAS solution. Calculate the COD of waste water.

g) Discuss the role of Polymers in Medicine and surgery.

Q.2. a) Calculate the amount of lime (85% pure) and Soda (95% pure) required to soften one million liter of water which contains $CaCO_3$ = 12.5ppm, $Mg\ CO_3$ = 8.4ppm, $CaCl_2$ = 22.2ppm, $MgCl_2$ =9.5 ppm, CO_2 = 33ppm, HCl = 7.3ppm, Organic matter = 16.8ppm. **6**

b) i) Give the preparation, properties and uses of Kevlar. **3**

ii) Define Cloud Point and Pour Point of a lubricant. **2**

c) Write a note on Decay of Concrete. **4**

Q.3. a) Define Moulding. List the different techniques of moulding. Explain injection moulding with the help of neat diagram. **6**

b) i) Explain the term 'Phase' with appropriate examples. **3**

ii) Discuss the role of gypsum during the manufacturing of Portland cement. **2**

c) Calculate the total hardness in ppm, in given water sample. **4**
: 50ml of standard hard water, containing 1mg pure $CaCO_3$ per ml consumed 20ml EDTA solution.
: 50ml of water sample consumed 30ml EDTA solution using EBT indicator.

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Q.4. a) Explain the zeolite method for softening of water giving suitable diagram and reactions. What are the limitations of this method. 6

b) i) 6gms of oil was saponified with 50ml of 0.5N alcoholic KOH solution. After refluxing for 2 hours the mixture was titrated with 25ml 0.5 N HCl. Find the saponification value of Oil. 3

ii) Distinguish between the wet and Dry process for manufacturing of Portland cement. 2

c) Discuss the following additives in compounding of plastics. 4
: Fillers : Plasticizers

Q.5. a) Write notes on : (any two) 6
: Glass transition temperature : Buna – S rubber : Vulcanisation

b) i) Distinguish between : BOD and COD. 3

ii) Define Oilness. What is its significance. 2

c) Discuss the application of Phase Rule to the one component system based on ; Diagram , triple point 4

Q.6. a) Define lubricants and lubrication. Mention the various mechanisms involved in lubrication of machines. Discuss boundary lubrication. 6

b) i) What is reduced or condensed Phase Rule. 3

ii) Discuss Reverse Osmosis. 2

c) What are carbon nanotubes. What are its types. Discuss the laser method for its production. 4

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