2E2004

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**B.Tech. II Semester (Main & Back) Examination, June/July - 2016**
**Common to All Branch**
**204 Chemistry & Environmental Engg.**

**Time : 3 Hours** **Maximum Marks : 80**
**Min. Passing Marks : 26**

***Instructions to Candidates:***

*Attempt any **five** questions, selecting one question from **each unit**. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*





**Unit - I**

**1.** a) Explain break point chlorination with diagram and also write it's advantages. **(6+2=8)**

b) Define degree of hardness. A Standard hard water solution contain 30g $CaCO_3$ per litre 30 ml. of this required 25 ml. of EDTA Solution on titration 30 ml. of water sample required 20 ml. of EDTA solution. The sample after boiling required 15 ml . EDTA solution. Calculate temporary, permanent and total hardness of water Sample. **(2+6=8)**

**OR**

**1.** a) What is the basic principle of complexometric titration and Clark's method also give chemical reaction? **(3+3=6)**

b) What do you understand by coagulation and sedimentation process? **(6)**

c) Calculate temporary, permanent hardness and total hardness present in hard water sample from following data obtained in Soap titration method when 40 ml. of water is titrated with soap solution

i) Lather factor = 0.8 ml. Soap solution

ii) Total hardness = 14.6 ml. Soap solution

iii) Permanent hardness = 7.5 ml. Soap solution

iv) Standard hardwater (SHW) = ,(250 mg/L $CaCO_3$) = 30.8 ml soap solution **(4)**

## Unit - II

2. a) Calculate the amount of lime and soda needed for softening 1,00,000 litres of water containing HCl = 8.3 mg/L, $Al_2(SO_4)_3$ = 36.2 mg/L, $MgCl_2$ = 11.5 mg/L, NaCl = 29.30 mg/L. Purity of lime is 90% and that of soda is 98%.

10% chemicals are to be used in excess in order to complete the reaction quickly. **(6)**

b) Describe carry over and caustic embrittlement. How can they be prevented? **(5+5=10)**

**OR**

2. a) Write short notes on Permutite method compare the lime - soda, Zeolite and Ion - exchange method.  **(6+4=10)**

b) A sample on analysis gave the following results - $H_2SO_4$ = 198 mg/L, $CaSO_4$ = 274 mg/L $MgSO_4$ = 28 mg/L and NaCl = 28 mg/L water is to be supplied to the town of the population of one lakh only. The daily consumption of water is 60 litre per head. Calculate the cost of lime and soda required for the softening the hardwater for town for the month may 2004. If the cost is Rs. 10/- per kg and soda is Rs. 8/- per kg. **(6)**

## Unit - III

3. a) What is Environmental Impact Assessment (EIA)? Discuss the methodology of EIA. **(10)**

b) Explain the hydrological cycle with neat diagram. **(6)**

**OR**

3. a) Define Ecosystem. Discuss energy flow in ecosystems. **(8)**

b) Discuss the following in brief :

i) Biodiversity

ii) Renewable sources of energy. **(4+4=8)**

## Unit - IV

4. Write short notes on following :

i) Acid rain

ii) Green house effect

iii) Ozone deplection

iv) Sanitary landfill **(4×4=16)**

**OR**

4. a) What is solid waste management? Write its classification and also write various method of solid waste disposal. **(10)**

   b) Explain the adverse effect of air pollution on climate. **(6)**

**Unit - V**

5. a) What is corrosion? Discuss the mechanism of electrochemical corrosion. **(8)**

   b) What do you understand by rain water harvesting? Discuss the rain water harvesting techniques. **(8)**

**OR**

5. a) Discuss the various methods of disposal of waste water and treatment of waste water. **(10)**

   b) Discuss the cathodic protection methods from corrosion. **(6)**