

**B.Tech. SEM -II (Chemical/ Civil/ Electrical/ Mechanical/ Production  
2014 Course (CBCS) : WINTER - 2018**

**SUBJECT: ENGINEERING CHEMISTRY**

Day: Friday  
Date: 16/11/2018

**W-2018-2272**

Time: 10.00 AM TO 01.00 PM  
Max. Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non programmable **CALCULATOR** is allowed.
- 4) Neat diagrams must be drawn **WHEREVER** necessary.
- 5) Assume suitable data if necessary.

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- Q.1 a)** Explain phosphate conditioning method for water softening. (06)
- b)** A zeolite softener gets exhausted on softening 4000 lit. of hard water calculate hardness of water if the exhausted zeolite requires 10 lit. of 10% NaCl solution for regeneration. (04)

**OR**

- Q.1** What are causes, disadvantages & prevention of scales & sludge formation? (10)
- Q.2** What is crystallography? Explain the law of constant elements of symmetries & Law of rational indices of Crystallography. (10)

**OR**

- Q.2 a)** What is cementing materials? Explain the classification of cement. Give the chemical composition of Portland cement. (06)
- b)** X-ray of wavelength  $2.2 \text{ \AA}$  are diffracted by a Bragg's crystal spectrometer at on angle  $17.3^\circ$  in the first order. What is the spacing of atomic layer in the crystal? (04)
- Q.3** What is calorific value of fuel? Draw a neat labeled diagram & give the construction, working of Boy's gas calorimeter. (10)

**OR**

- Q.3 a)** What is proximate analysis of coal? How various factors are determined in proximate analysis of coal? (06)
- b)** Define and explain: (04)
- i) Calorific value    ii) GCV    iii) NCV

**P.T.O.**

**Q.4** What is Electrochemical corrosion? Explain Galvanic corrosion and Concentration cell corrosion with diagram. **(10)**

**OR**

**Q.4 a)** Explain the Electroplating method. **(06)**

**b)** Write note on Galvanizing. **(04)**

**Q.5** State & explain Kohlrausch's Law of independent migration of ions & Give its applications. **(10)**

**OR**

**Q.5 a)** What are the postulates of Ionic theory/Arrhenius theory? **(06)**

**b)** Write short note on fuel cell. **(04)**

**Q.6** Define the term conformational isomerism & Explain the conformation of n-butane. **(10)**

**OR**

**Q.6 a)** What is Geometrical isomerism? Discuss it in detail with suitable examples. **(06)**

**b)** Explain the Following terms:  
i) Enantiomers ii) Diastereoisomers **(04)**

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