

**B.TECH. SEM -II (CHEMICAL/ CIVIL/ ELECTRICAL/  
MECHANICAL/ PRODUCTION 2014 COURSE (CBCS) :**

**WINTER - 2017**

**SUBJECT: ENGINEERING CHEMISTRY**

Day: **Thursday**  
Date: **23/11/2017**

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

**W-2017-2008**

**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

**Q.1** Explain Boiler corrosion as ill effects of using hard water in boilers. State (10)  
their causes and preventive measures.

**OR**

- a) Write a note on Priming and Foaming. (06)
- b) How many liters of hardwater of hardness 740 ppm  $\text{CaCO}_3$  equivalent can be (04)  
softened by a zeolite which requires 10 liters of 15% NaCl solution?

**Q.2** Derive Bragg's equation for diffraction of X-rays by crystal with diagram. (10)

**OR**

- a) What is cementing materials? Give the classification of cement. (06)
- b) The spacing between the principal plans of NaCl crystal is  $5.32 \text{ \AA}$ . What is (04)  
the wavelength of X- ray when the first order Bragg's reflection is observed  
at an angle  $20^\circ$ ?

**Q.3** What is fuel? Explain the Ultimate analysis of coal with diagrams. (10)

**OR**

- a) Define and explain the following terms: (06)
  - i) Calorific value
  - ii) Gross Calorific value
  - iii) Net Calorific value
- b) What are the properties of Good fuels? (04)

**P.T.O**

**Q.4** What is the principle of Cathodic protection? How metal is protected by using cathodic protection methods explain with diagrams? (10)

**OR**

**a)** What is corrosion? Explain the Electroplating method. (06)

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

**Q.5** What is Electrochemistry? Explain Kohlrausch's law of independent migration of ions. (10)

**OR**

**a)** Define and explain the following terms (06)

i) Molar conductivity

ii) Specific conductance

iii) Equivalent conductivity

**b)** Explain Ostwald's dilution law. (04)

**Q.6** Write note on Geometrical isomerism with examples. Explain 'E' & 'Z' system for Geometrical isomers. (10)

**OR**

**a)** Define Conformational isomerism. Explain conformation of Ethane. (06)

**b)** How do you represent Newman projection formula and Fischer projection formula of n-butane. (04)