

**B.TECH. SEM -I COMPUTER/ INFO. TECH./ ELECTRONICS /
BIO MEDICAL / E & TC) 2014 COURSE (CBCS) : SUMMER -
2018**

SUBJECT: ENGINEERING CHEMISTRY

Day: Thursday
Date: 24/05/2018

S-2018-2208

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 to the non-programmable **CALCULATOR** is allowed.
 - 4) Neat diagram must be drawn **WHEREVER** necessary.
 - 5) Assume suitable data if necessary.
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Q.1 What is Permutit? Discuss in brief Permutit process of removing temporary and permanent hardness of water. How it is regenerated when it is exhausted in the process. Give the advantages and disadvantages. **(10)**

OR

Q.1 a) What are boiler scales and sludges? What are their disadvantages in boilers? How are these prevented? **(05)**

b) A completely exhausted zeolite softener needs 120 litres of 10% brine solution for regeneration. How many litres of hard water of hardness 480 ppm can be softened by softener? **(05)**

Q.2 State different laws of crystallography. **(10)**

OR

Q.2 a) What are Weiss indices and Miller indices? If the lattice plane cuts x,y and z axes at 3a, 2b, -1c. Find Weiss indices and Miller indices. **(05)**

b) What is Portland cement? Give the chemical composition and compound constituents of Portland cement. **(05)**

Q.3 Draw a neat sketch of Bomb calorimeter. Explain its construction and working. **(10)**

OR

Q.3 a) What is proximate analysis of coal? Explain how the different factors are determined in proximate analysis. **(05)**

b) Calculate the gross and net calorific value of a coal sample having the following composition: **(05)**
C = 82%, H = 8, O = 3%, S = 2.5, N = 1.5 and Ash = 3%.

P.T.O.

Q.4 Explain hydrogen evolution and oxygen absorption mechanism of electrochemical corrosion. (10)

OR

Q.4 a) What is principle of cathodic protection? How metal is protected by using sacrificial anode? (05)

b) "Passivity is not a static but a dynamic phenomenon". Comment. (05)

Q.5 State and explain Kohlrausch's law of independent migration of ions. Give its applications. (10)

OR

Q.5 a) What is buffer solution? Give its preparation and mechanism. (05)

b) State and explain Ostwald's dilution law. (05)

Q.6 a) Define and explain the following terms: (05)

i) Enantiomers ii) Optical isomerism

b) How do you represent Newmann projection formula of n-butane (05)

OR

Q.6 a) What is conformational isomerism? Discuss the conformational isomerism in ethane. (05)

b) Discuss in brief geometrical isomerism. (05)

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