ADDITIONAL EXAM. COMMON FOR COMPUTER/E &TC/ELECTRONICS /IT /
Biomedical **B.TECH. SEM. - I (CBCS 2014 COURSE) : WINTER- 2019**
SUBJECT: ENGINEERING CHEMISTRY

Monday 30/12/2019
10:00 AM-01:00 PM

W-11250-2019
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) Draw neat and labeled diagram **WHEREVER** necessary.

Q.1 Draw neat and labeled diagram of permutit (or zeolite process) of softening water. Discuss the chemistry involved in it. Discuss its merits and demerits. **[10]**

OR

Q.1 Write note on: **[10]**

i) Phosphate conditioning

ii) Scales and sludges

Q.2 a) Define Portland cement with its chemical composition and compound constituents. **[05]**

b) What are Weiss indices and Miller indices? If certain lattice plane intersects the X, Y and Z axes at distance 1a, 2b, ∞ c? What will be Weiss indices and Miller indices? **[05]**

OR

Q.2 What are causes of crystal defect? Give an account of Frenkel and Schottky defect. **[10]**

Q.3 How the calorific value of a solid fuel is determined using Bomb calorimeter experiment? Explain with suitable diagram. **[10]**

OR

Q.3 a) Write in brief about proximate analysis of coal and its importance. **[06]**

b) Using Dulong's formula, calculate HCV and LCV of coal having following analysis: **[04]**
C = 75%, H = 15%, O = 5%, N = 3%, Ash = 2%.

Q.4 a) Write note on cathodic protection to prevent corrosion. **[06]**

b) "Passivation is a static state not a dynamic one". Comment. **[04]**

P.T.O.

OR

Q.4 What is corrosion? Explain hydrogen evolution and oxygen absorption mechanism of electrochemical corrosion. **[10]**

Q.5 **a)** What is conductometric titration? Explain the titration curve for strong acid – strong base titration. **[06]**

b) Write a note on fuel cell. **[04]**

OR

Q.5 State and explain Kohlaursch's law of independent migration of ions with its applications. **[10]**

Q.6 What is conformational isomerism? Draw and explain the potential energy diagram for the various conformations of n-butane. **[10]**

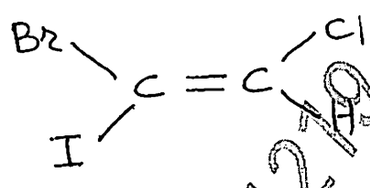
OR

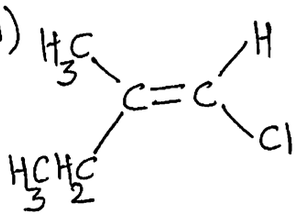
Q.6 **a)** Write note on: **[06]**

i) Optical isomerism

ii) Racemic mixture and meso compound.

b) Assign E and Z configuration of each of the following: **[04]**

i) 

ii) 

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