B. Tech - sem-I, (2014 course), computer - winter-2018

B.Tech. SEM -I Computer/ Info. Tech./ Electronics / Bio Medical / E & TC) 2014 Course (CBCS) : WINTER - 2018

SUBJECT: ENGINEERING CHEMISTRY

Day: Thursday
Date: 29/11/2018

W-2018-2264

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.

Q.1 a) Explain the permutit process with help of labelled diagram. Write main reactions occurring in the process. **(06)**

b) Write note on phosphate conditioning. **(04)**

OR

Q.1 a) What are the scales and sludges? Give their causes of formation, disadvantages and preventive measures in a boiler. **(06)**

b) Write note on caustic embrittlement. **(04)**

Q.2 a) What is Portland cement? Give its chemical composition and compound constituents with its properties. What is role of gypsum in setting of cement? **(06)**

b) What are Weiss indices and miller indices? If certain lattice plane intersects the X, Y and Z axes at distance 3a, 2b, -1c what will be Weiss indices and miller indices? **(04)**

OR

Q.2 What is crystallography? Explain the different laws of crystallography. **(10)**

Q.3 a) How is the calorific value of gaseous fuel determining using Boy's gas calorimeter? **(06)**

b) Why and how corrections are made in the determination of calorific value by Bomb's calorimeter? **(04)**

OR

Q.3 a) Explain the importance of ultimate analysis of coal. **(06)**

b) Composition of a coal sample is : C = 81%, H = 5%, O = 8.5%, S = 1.0% and N = 1.5% and ash = 3%. Calculate the gross and net calorific value of the coal sample. **(04)**

P.T.O.

Q.4 Discuss the anodic and cathodic metallic coating. Which is more preferred? **(10)**

OR

Q.4 **a)** What are different factors affecting dry and wet corrosion? **(06)**

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

Q.5 **a)** What is conductometric titration? Explain the titration curve for weak acid strong base titration. **(06)**

b) The solubility of AgCl in water is 1.34×10^{-5} mole/dm^3. Calculate its solubility product. **(04)**

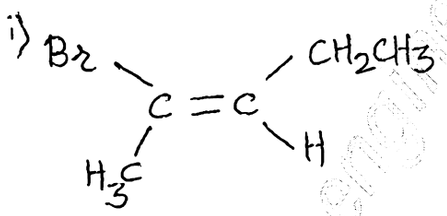
OR

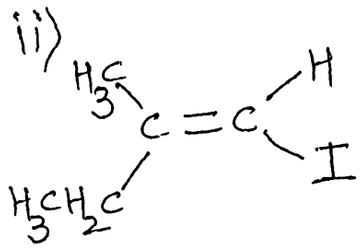
Q.5 **a)** Write a note on Fuel cells. **(06)**

b) Explain solubility and solubility product. **(04)**

Q.6 **a)** State and explain following terms: **(06)**
i) Enantiomers ii) Geometrical isomerism iii) Optical isomerism

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





OR

Q.6 What is conformational isomerism? Discuss the conformational isomerism of n-butane. **(10)**

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