S.E - IV Sem - Chem 13/5/16

Engineering Chemistry - II

05/2016
2:30 pm to 6:30 pm

/IV/CBGS/CHEM./EC - II

Q.P. Code : 572900

29

(3 Hours) **[Total Marks : 80**

N.B. : (1) Questions **No.1 is compulsory.**
(2) Attempt **any three** from remaining **five** questions.
(3) **Figures** to the **right** indicate **full marks.**

1. Answer **any four** of the following : **20**
   (a) What are the applications of surfactants in food industry?
   (b) How will you titrate strong acid with strong base without using any indicator. Explain the method in detail.
   (c) Explain the effect of temperature on conductivity.
   (d) Explain the role of complexing agent in solvent extraction.
   (e) Explain the splitting of NMR signal in Ethyl acetate and Ethyl methyl ether.
   (f) Define catalyst and discuss any four characteristics of catalyst.
   (g) Discuss the principle and applications of HPLC.

2. (a) Write a note on precipitation titration and explain the limitations of conductometric titrations. **5**
   (b) Write an expression for emf on a concentration cell without transference. **5**
   (c) Write a note on Donnan membrane equilibrium. **5**
   (d) Write a note on Auto-catalysis and induced catalysis. **5**

3. (a) Give the principle and explain any two applications of IR Spectroscopy. **5**
   (b) What are the advantages of potentiometric titrations? Give it's limitations. **5**
   (c) Explain the continuous and Batch extraction process. **5**
   (d) Explain the Huckel's rule and expedite the Aromaticity of Naphthalene. **5**

4. (a) $100cm^3$ of an aqueous solution containing 0.200gm of a solute was shaken with $50cm^3$ of organic solvent. If the distribution ratio $D_{o/w} = 120$. Calculate the amount of solute unextracted and the percentage of extraction. **5**
   (b) Describe the working of flame photometer. **5**
   (c) Discuss De-bye Huckel theory of strong electrolytes. **5**

TURN OVER

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(d) Give the preparation of 5
(i) 4 - methyl uracil
(ii) Ethyl methyl ketone, from Aceto Acetic ester.

5. (a) Write a note on transport number. 5
(b) Explain why pyridine is more basic than pyrrole. 5
(c) Write a note on enzyme catalysis. 5
(d) Explain the origin of charges on colloidal particles. 5

6. (a) How would you prepare the following compound from diethyl malonate : 5
(i) Succinic acid
(ii) Barbituric acid
(b) Write a note on intermediate compound theory. 5
(c) Explain the electrophilic substitution reactions of thiophene. 5
(d) 100cm^3 of an aqueous solution is extracted twice with 40cm^3 portions of an organic phase. If the percentage of extraction is 99%. Calculate the value of distribution ratio in favour of organic phase. 5