

END SEMESTER EXAMINATION

Nov/Dec-2018

AC-101 CHEMISTRY

Time: 3 Hours

Max. Marks: 40

Note: Answer FIVE questions. Question number ONE is compulsory.
Assume suitable missing data, if any.

- 1 Answer the following questions [12]
- [a] What do you mean by a titration curve? Draw a titration curve for strong acid and strong base system. Suggest a suitable indicator for the same.
- [b] Calculate the approximate frequency of the C-X stretching from the following data:
Force constant = 500 Nm^{-1} , mass of carbon atom = $20 \times 10^{-24} \text{ g}$, mass of X atom = $1.6 \times 10^{-24} \text{ g}$.
- [c] Write the types of polymerization that may be carried out using following initiators:
Benzoyl peroxide, RMgX , $\text{TiCl}_4/\text{AlMe}_3$, $\text{BF}_3 \cdot \text{H}_2\text{O}$.
- [d] Explain the discharge curve of a battery with a suitable graph?
- [e] Is it possible to have a quadruple point in the phase diagram of one component system? Explain the answer.
- [f] Calculate the % atom economy of the following reaction for the production of water;
$$\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightleftharpoons 2\text{H}_2\text{O}(\text{g}) + \text{CO}_2(\text{g})$$
- 2 [a] Define TGA. Draw and write the significance of TGA thermograms. [3]
- [b] What is Zeigler-Natta Catalyst. Discuss Co-ordination polymerization and write its significance. [4]
- 3[a] Discuss the theories of indicators. Explain the structural change in diphenylamine in Redox titration. [3]
- [b] How many NMR signals are expected in 1-chlorobutane and butanol. Show their splitting as well. [4]

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- 4 [a] A solution contains 1:2 ratio of masses of particle of two substances with molar masses 10 Kg/mol and 20 Kg/mol, respectively. Determine the PDI of solution [3]
- [b] What do you mean by primary and secondary batteries? Explain lead acid battery with charging and discharging reactions. [4]
- 5 [a] Explain eutectic point with the help of a suitable phase diagram. [3]
- [b] Define Nitrogen rule. Draw labelled block diagram of double beam UV-Visible spectrophotometer. Explain its significance over single beam spectrophotometer. [4]
- 6 [a] Define Gibbs phase rule. Draw and explain phase diagram of water. [3]
- [b] What is electroplating. Describe its significance. [4]
- 7 [a] Write six important characteristics of batteries. [3]
- [b] Write any four principles of green chemistry. Discuss green solvent in detail. [4]