Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **16CH2006** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SURFACE CHEMISTRY AND CHEMICAL KINETICS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | What is surface energy? Explain the effect of temperature on surface tension. | CO1 | 10 |
| b. | The surface tension of the following molecules are given below. Explain why there is a decrease of the same from water to ethyl ether. H2O, CHCl3, CCl4, CH3OH, ethyl ether.  C2H5OH, toluene (72.8, , 27.1, 26.8, 22.6, 17.0 dynes/cm) | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Discuss the effects of surface tension in detail. | CO1 | 8 |
| b. | Explain different types of liquid crystals and their properties with example. State few application of liquid crystals. | CO1 | 12 |
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| 3. | a. | Describe the electro-osmosis and electrophoresis methods with a neat sketch. | CO2 | 15 |
| b. | What are ultrafilters? How are they prepared? | CO2 | 5 |
| **(OR)** | | | | |
| 4. | a. | What is Tyndall effect? If you are given a colloid, true solution and a suspension, what method will you use to identify each? | CO2 | 10 |
| b. | Explain the determination of size of colloidal particles. | CO2 | 10 |
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| 5. | a. | Explain in detail on the factors affecting the stability of emulsions. | CO2 | 10 |
| b. | Discuss on different types of surface active agents used in forming emulsions. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | Discuss the various chemical methods of preparation of colloidal sols. | CO2 | 12 |
| b. | Explain in detail any one of the electrokinetic property of colloids. | CO2 | 8 |
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| 7. | a. | Derive Michaelis-Menten equation for enzyme catalysed reaction. | CO3 | 14 |
| b. | Nitrous oxide N2O decomposes into N2 and O2, the reactants and the products being all gaseous. If the reaction is first order, develop expression for the rate constant as a function of time, initial pressure and the total pressure.  N2O N2 (g) + ½ O2 (g) | CO3 | 6 |
| **(OR)** | | | | |
| 8. | a. | Derive the integration of second order rate expression when the reactants are different. | CO3 | 15 |
| b. | List out the general characteristics of the catalyst. | CO3 | 5 |
|  | | **Compulsory**: |  |  |
| 9. | a. | List out the differences between chemisorption and physisorption. | CO2 | 8 |
| b. | Derive the BET equation for adsorption of gas on solid surface. | CO2 | 12 |