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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May – 2017**

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
|  |  | Give a detailed account of the principles and applications of X-ray photoelectron spectroscopy. | CO2 | 20 |
| (OR) | | | | |
| 2. | a. | Mention any four differences between physisorption and chemisorption. | CO2 | 4 |
| b. | What form does the Langmuir adsorption isotherm take at extreme high pressure? | CO2 | 4 |
| c. | Define adsorbent and adsorbate. | CO2 | 4 |
| d. | Give a brief account of Freundlich adsorption isotherm. | CO2 | 8 |
| 3. | a. | What are the assumptions made by Langmuir on deriving Langmuir adsorption isotherm? Derive the expression for Langmuir adsorption isotherm. | CO2 | 12 |
| b. | Give B.E.T adsorption isotherm equation and explain the terms in it. | CO2 | 4 |
| c. | Give the values of energy involved in physisorption and chemisorption. | CO2 | 4 |
| (OR) | | | | |
| 4. | a. | Derive an expression for the rate constant of first order reaction. | CO3 | 10 |
| b. | Derive the Arrhenius relationship between rate constant and energy of a reaction. | CO3 | 10 |
| 5. | a. | Derive an expression for the rate constant of a second order reaction of the type A + B → Products. | CO3 | 10 |
| b. | Explain activation energy with suitable illustration. | CO3 | 5 |
| c. | Mention the characteristics of catalysts. | CO3 | 5 |
| (OR) | | | | |
| 6. | a. | Give two examples for fast reaction. | CO3 | 2 |
| b. | Explain pseudo-unimolecular reaction with examples. | CO3 | 4 |
| c. | Give the differences between order and molecularity of reactions. | CO3 | 4 |
| d. | Derive an expression for the second order reaction of the type 2A → Products. | CO3 | 10 |
| 7. | a. | Give an account of the types of liquid crystals. | CO1 | 10 |
|  | b. | Explain the applications of liquid crystals. | CO1 | 10 |
| (OR) | | | | |
| 8. |  | Explain (a) sols (b) gels (c) electrophoresis and (d) electro-osmosis. | CO1 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | Elaborate the types and properties of colloids. | CO1 | 20 |

ALL THE BEST