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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**Supplementary Examination – June – 2017**

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| **Code :** | **15CH3008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ORGANOMETALLIC, BIOINORGANIC AND SOLID STATE CHEMISTRY** | **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. | State 18 electron rule. What is its impotance? Explain the rule with two examples. | CO1 | 8 |
| b. | Write two examples of stable metal carbonyl complexes. Write any two methods for the preparation of metal carbonyl complexes? How are they characterized? | CO1 | 12 |
| (OR) | | | | | |
| 2. | a. | | How are the metal carbonyl hydride complexes prepared? Write the formula and structure of Vaska’s complex. | CO1 | 8 |
| b. | | How are Fischer carbine and Schrock carbine complexes are synthesized? Compare the structure and reactivity of these two types of complexes. | CO1 | 12 |
| 3. | a. | | Draw the molecular orbital diagram of a metallocene. Discuss the structure and bonding in ferrocene. | CO1 | 12 |
|  | b. | | Explain the fluxionality in organometallic complexes. | CO1 | 8 |
| (OR) | | | | | |
| 4. | | a. | Explain the oxidative addition and migratory insertion reactions with an example. | CO1 | 8 |
|  | | b. | Write the structure of Wilkinson catalyst. Draw and discuss the various steps involved in catalytic cycle of alkene hydrogenation reaction. | CO1 | 12 |
| 5. | | a. | Explain the reaction catalyzed by the Ziegler-Natta catalyst. | CO1 | 8 |
|  | | b. | With a neat diagram discuss the various steps involved in the photochemical process. | CO1 | 12 |
| (OR) | | | | | |
| 6. | | a. | Write the importance of ruthenium polypyridine complexes. With a diagram, explain the standard reduction potentials associated with the redox properties of ruthenium polypyridine complexes. Describe the applications of these complex in solar energy conversion. | CO1 | 16 |
|  | | b. | Draw the structure of porphine molecule. Is it aromatic? | CO1 | 4 |
| 7. | | a. | Write a detailed account on binding of dioxygen molecule with the heme group. Explain the function of Hemoglobin and state the importance of the Perutz mechanism. | CO1 | 16 |
|  | | b. | Draw the structure of ferridoxin. Where it is utilized? | CO1 | 4 |
| (OR) | | | | | |
| 8. | | a. | Discuss the structure of active sites of carbonicanhydrase and carboxypeptidase. Explain the reactions catalyzed by these two enzymes. | CO1 | 16 |
|  | | b. | Write a note on platinum anticancer drugs. | CO1 | 4 |
|  | | | **Compulsory:** |  |  |
| 9. | | a. | With diagrams explain Schottky and Frenkel defects. | CO1 | 10 |
|  | | b. | Discuss the structures of fluorite and Caesium chloride | CO1 | 10 |