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

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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12CH320** | **Duration :** | **3hrs** |
| **Sub. Name :** | **CHEMICAL APPROACH TO NANOMATERIALS** | **Max. marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Marks** |
| 1. | a. | Name the methods that are used for reducing the feature size in microcontact printing. Explain any two of them. | (10) |
| b. | Explain the principle of ‘Dip-Pen Nanolithography’. What are their applications? | (10) |
| (OR) | | | |
| 2. | a. | Describe the Topologically Directed Etching Process. What are their advantages? | (10) |
| b. | Explain the enzymatic nanolithography using Dip-pen Nanolithography. | (10) |
| 3. | a. | Write any two examples for Nature’s photonic crystals. | (2) |
|  | b. | How are Silica Microspheres synthesized? | (6) |
|  | c. | What are photonic inks? Explain the origin of color in photonic inks. | (12) |
| (OR) | | | |
| 4. | a. | Write an account on Multi-shell Microspheres. | (2) |
|  | b. | Describe the Evaporation induced self Assembly process for the formation of colloidal crystal films. | (6) |
|  | c. | Discuss the method of introducing liquid crystal into a colloidal crystal with an example. What are the consequences? | (12) |
| 5. | a. | Explain the synthesis of hydrogen storage coordination network with an example. What are their advantages over zeolites? | (10) |
|  | b. | Discuss the formation of self assembly at the Mica-Water and Graphite-Water interfaces. | (10) |
| (OR) | | | |
| 6. | a. | Write a detailed account on the mesoscale building blocks. What are the techniques used for characterizing the mesostructure? | (10) |
|  | b. | Explain the various types of periodic Mesoporous silica polymer hybrids. | (10) |
| 7. | a. | State the forces involved in the assembly of Supra-micron shapes and explain the synthesis using the capillary forces. | (8) |
|  | b. | Explain the steps involved in the formation of polyhedra with patterned faces that autoconstruct. | (12) |
| (OR) | | | |
| 8. | a. | Describe the process for making and assembling micron-sized hexagonal shaped plates into ordered 3D arrays. | (12) |
|  | b. | With principle, explain the process of Autonomous self assembly. | (8) |
|  | | **Compulsory:** |  |
| 9. | a. | What are the two major bioinspired strategies? Discuss about them. | (8) |
|  | b. | What is meant by dubiofossils? | (2) |
|  | c. | Describe the process of interconnecting capped nanoclusters using complementary DNA sequences with a neat diagram. | (10) |

ALL THE BEST