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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14CH2023** | **Duration :** | **3hrs** |
| **Sub. Name :** | **APPLIED NANOCHEMISTRY AND NEXT GENERATION MATERIALS** | **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 are the various classifications of nanoparticles? Give examples. | CO1 | 4 |
| b. | What is top-down approach and how is used to prepare 1D nanostructures. | CO1 | 8 |
| c. | Write the procedure for the preparation metallic nanoparticles. | CO1 | 6 |
| d. | What are the tool used to characterize the fabricated nanoparticles. | CO1 | 2 |
| (OR) | | | | |
| 2. | a. | How will you synthesis Gold nanoparticles in the laboratory? | CO1 | 6 |
| b. | Discuss the Bottom-up method for the synthesis of nanoparticles. | CO1 | 8 |
| c. | How nanoparticles are prepared by Sol-Gel method- Explain? | CO1 | 6 |
| 3. | a. | What are the various nucleation modes of the fundamentals of film growth | CO1 | 6 |
|  | b. | Describe the various conditions for the growth of single crystal films, amphorus films and polycrystalline films. | CO1 | 8 |
|  | c. | How will form the thin film by Sputtering method – Explain with diagram? | CO1 | 6 |
| (OR) | | | | |
| 4. | a. | Explain the working concept with components of MBE with diagram. | CO2 | 8 |
|  | b. | Discuss the fabrication of nanofibres by Electrospinning technique with diagram. | CO1 | 6 |
|  | c. | What do you mean by physical vapour deposition (PVD) for the growth species? | CO2 | 6 |
| 5. | a. | How will you synthesis carbon nano tubes? Explain with diagrams. | CO1 | 10 |
|  | b. | Write a notes on classifications of Inorganic Nanoparticles and its characteristics. | CO1 | 5 |
|  | c. | Discuss the various applications of carbon nanotubes. | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | What do you mean by zeolites? Explain their types of crystal building units. | CO1 | 8 |
|  | b. | How will you synthesis of Fullrenes (any two methods) and its applications. | CO1 | 10 |
|  | c. | Write the photionisation of fullrene ions. | CO2 | 2 |
| 7. | a. | Write the working principle and the components of AFM with diagram. | CO2 | 10 |
|  | b. | Write a notes about the structures of metal oxide nanocomposites. | CO2 | 6 |
|  | c. | Write the disadvantages of AFM. | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | Describe the working principle of STM technique with diagram. | CO2 | 10 |
|  | b. | Discuss the Organic-Inorganic hybrids and their its classes. | CO1 | 6 |
|  | c. | Identify any two next generation nanomaterials and write its applications. | CO2 | 4 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain the working concept with the components of TEM. | CO2 | 10 |
|  | b. | Why STM is called as Tunneling microscopy and write its disadvances. | CO2 | 5 |
|  | c. | Write any five smart nanoparticles and its applications. | CO2 | 5 |