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**

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| **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. | Image result for nanofiberIdentifiy the picture and write the preparation methodology, materials used and its application. | CO5 | 8 |
| b. | Discuss the bottom up method for the preparation of nanoparticles. | CO4 | 8 |
| c. | Describe the working principle of Ball milling. | CO4 | 4 |
| (OR) | | | | |
| 2. | a. | How the 1D nanostructure is prepared by top down method? Explain | CO4 | 8 |
| b. | How will you prepare Spinel Nanoparticles in the Lab? | CO5 | 6 |
| c. | Write the preparation of any two Nanoparticles using the Sol-Gel method. | CO3 | 6 |
| 3. | a. | Write the difference between evaporation and sputtering. | CO3 | 7 |
|  | b. | Narrate the working principle of Electrospinning for the nanowire . | CO4 | 8 |
|  | c. | Describe epitaxy with examples. | CO3 | 5 |
| (OR) | | | | |
| 4. | a. | Briefly describe molecular beam epitaxy (MBE) with a neat diagram. | CO4 | 8 |
|  | b. | Explain the basic nucleation modes for the formation of thin films with diagram. | CO5 | 7 |
|  | c. | What do you mean by physical vapour deposition (PVD) for the growth species? | CO3 | 5 |
|  | | | | |
| 5. | a. | What is CNT? How will you prepare CNT and explain with diagram? | CO4 | 10 |
|  | b. | Explain the photoionisation of fullrenes. |  | 3 |
|  | c. | What do you mean by zeolites? Discuss their types of crystal building units. |  | 7 |
| (OR) | | | | |
| 6. | a. | What is Buckyball? How will you prepare and explain with diagram? | CO4 | 10 |
|  | b. | How will you fabricate the core-shell structures of inorganic nanoparticles? | CO3 | 5 |
|  | c. | Discuss the applications of carbon nanotubes. | CO3 | 5 |
| 7. | a. | Discuss the cantilever based probe microscopy and discuss its working principles. | CO5 | 10 |
|  | b. | Write the disadvantages of STM. | CO3 | 5 |
|  | c. | Discribe the various applications of nanomaterials. | CO4 | 5 |
| (OR) | | | | |
| 8. | a. | Write the working principle and the components of TEM. | CO4 | 10 |
|  | b. | Discuss the concept of soft lithography. | CO3 | 5 |
|  | c. | Write a short note on Organic-Inorganic hybrids and their its classes. | CO4 | 5 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Narrate the working principles of electron tunneling effect in STM with diagram. | CO5 | 10 |
|  | b. | Discuss any five smart nanoparticles as a part of next generation materials and its applications. | CO6 | 5 |
|  | c. | Narrate the various physical properties of nanoparticles | CO4 | 5 |

ALL THE BEST