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 do you mean by nanoparticles and their classifications? Give examples | CO1 | 6 |
| b. | What is bottom-up method and how is used to prepare 1D nanostructures | CO1 | 8 |
| c. | How will you prepare metallic nanoparticles? Write its procedure | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | How nanoparticles are prepared by Sol-Gel method- Explain? | CO1 | 8 |
| b. | Discuss the top down approach for the synthesis of nanoparticles | CO1 | 6 |
| c. | How will you synthesis Silver nanoparticles in the laboratory? | CO1 | 6 |
| 3. | a. | Explain the fundamentals of film growth by various nucleation modes | CO1 | 6 |
|  | b. | Discuss the conditions for the growth of single crystal films, amphorus films and polycrystalline films | CO1 | 9 |
|  | c. | Write the concept of physical vapour deposition (PVD) for the growth species | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | How will you get nanofibres by Electrospinning technique, explain with diagram? | CO2 | 6 |
|  | b. | What do you mean by MBE ? Explain its working components with diagram? | CO2 | 8 |
|  | c. | Describe the concept of Sputtering for the formation of thin films | CO2 | 6 |
| 5. | a. | How the CNT is synthesized by Arc Discharge and Laser ablation methods | CO1 | 10 |
|  | b. | Discuss the general characteristic and classifications of Inorganic Nanoparticles | CO1 | 5 |
|  | c. | Describe the CVD method of synthesis of carbon nanotubes | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Write a notes on zeolites and its three types of crystal building units | CO1 | 8 |
|  | b. | Discuss the various method of synthesis of Fullrenes and its applications | CO1 | 10 |
|  | c. | Write the process of photionisation of C60 ions | CO2 | 2 |
| 7. | a. | Describe the working principle of STM technique with diagram | CO2 | 10 |
|  | b. | Write a notes on Organic-Inorganic hybrids and their two classes | CO1 | 6 |
|  | c. | Write the various applications of inorganic nanocomposites | CO2 | 4 |
| (OR) | | | | |
| 8. | a. | Specify cantilever based probe microscopy and discuss its working principles with diagram? | CO2 | 10 |
|  | b. | Discuss the structures of metal oxide nanocomposites | CO1 | 6 |
|  | c. | What do you mean by core shell nano composites | CO1 | 4 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain the various components present in the TEM and their functions | CO2 | 8 |
|  | b. | How the electron behavior in STM differs from other microscopical techinques | CO2 | 6 |
|  | c. | Discuss the various applications of the nanoparticles in the area of Energy and Healthcare | CO2 | 6 |

ALL THE BEST