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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **16NT2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SYNTHESIS OF NANOMATERIALS** | **Total Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1 | a. | Discuss the synthesis of nanoparticles through heterogenous nucleation. | CO1 | 6 |
| b. | Explain the synthesis of zero dimensional metallic and semi conductor nanoparticles. | CO1 | 14 |
|  |  | **(OR)** |  |  |
| 2 | a. | Explain the various kinetically confined synthesis procedures of nanoparticles. | CO1 | 10 |
| b. | Describe the fabrication of one dimensional nanoparticles by  i) spontaneous growth process and ii) template based synthesis. | CO1 | 10 |
|  |  |  |  |  |
| 3 |  | With a suitable sketch, differentiate between electrospinning and electro spraying processes in the preparation of nanoparticles. | CO2 | 20 |
|  |  | **(OR)** |  |  |
| 4 |  | List the different types of high energy ball milling techniques and explain each one in detail with necessary diagrams. | CO2 | 20 |
|  |  |  |  |  |
| 5 | a. | Discuss the different steps involved in sol-gel method. | CO2 | 5 |
| b. | Explain the working principle and preparation of two dimensional nanostructures by chemical vapour deposition. | CO2 | 15 |
|  |  | **(OR)** |  |  |
| 6 | a. | Explain the fabrication of two dimensional nanostructures by physical vapour deposition. | CO2 | 10 |
| b. | Recall the graphical representation of density of states Vs Energy for 3D,2D,1D and 0D nano structures. | CO1 | 10 |
|  |  |  |  |  |
| 7 |  | With a neat sketch, explain the construction and working principle of pulsed laser deposition process for deposition of two dimensional nanostructures. | CO2 | 20 |
|  |  | **(OR)** |  |  |
| 8 | a. | Explain the process of atomic layer deposition. | CO2 | 10 |
| b. | Differentiate between pulsed laser deposition and pulsed electron deposition. | CO2 | 10 |
|  | | **Compulsory:** |  |  |
| 9 | a. | Describe scanning probe patterning. | CO2 | 5 |
| b. | Differentiate between the process of photolithography and soft lithography with suitable sketch. | CO2 | 15 |