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



**End Semester Examination – Nov/Dec - 2017**

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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. | Explain in detail the instrumentation and working principle of Molecular Beam Epitaxy (MBE). | CO1 | 10 |
|  | b. | Schematically explain the working principle of electrospinning. | CO1 | 10 |
|  |  | (OR) |  |  |
| 2 | a. | Explain the working principle of Electroplaing. | CO1 | 10 |
|  | b. | Briefly discuss the setup of Spray pyrolysis technique. | CO1 | 10 |
|  |  |  |  |  |
| 3 |  | What are different types of high energy ball milling and explain them in detail with necessary diagrams. | CO2 | 20 |
|  |  | (OR) |  |  |
| 4 | a. | Write the synthesis procedure for any two metal chaleogenide nanotubes. | CO2 | 10 |
|  | b. | Discuss the working principle of sputter deposition technique. | CO1 | 10 |
|  |  |  |  |  |
| 5 | a. | What are the different steps involved in sol-gel method. | CO2 | 5 |
|  | b. | How to prepare ZnO and TiO2 nanoparticles using sol-gel method. | CO2 | 10 |
|  | c. | Draw the graph between DOS and energy for 3D,2D,1D and 0D with an example. | CO1 | 5 |
|  |  | (OR) |  |  |
| 6 |  | Briefly write the procedure to prepare Zirconia and tungsten carbide balls in ball milling process. | CO2 | 20 |
|  |  |  |  |  |
| 7 | a. | What are the 3 different methods in which CNT can be synthesized ? | CO2 | 12 |
|  | b. | Write down the procedure for synthesis of CdS nanorods. | CO2 | 8 |
|  |  | (OR) |  |  |
| 8 | a. | Draw a flow chart representing the various steps involved in synthesis of GO using Hummers modified method. | CO2 | 10 |
|  | b. | Write down the various chemical reactions involved in CVD. | CO1 | 6 |
|  | c. | Difference between electro and electroless plating. | CO1 | 4 |
|  | |  |  |  |
|  | | **Compulsory:** |  |  |
| 9 | a. | What is soft lithography? | CO1 | 2 |
|  | b. | Draw the flow chart for different types of Soft lithography. | CO1 | 3 |
|  | c. | Diagramatically explain the types of replica moulding. | CO1 | 15 |

ALL THE BEST