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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **Ph.D. Course Work End Term Examinations – JAN-FEB 2025** |
| **Date:** 03 – 02- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** Ph. D | |
| **Course Code :** PHY806 | Course Name : Nanoscience and Nanotechnology | |
| **Semester**: | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **30** | **30** | **40** |  |  |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 10 marks. 6Q x 10M=60Marks** | | | | |
| **1** | Explain the differences between top-down and bottom-up approaches for nanomaterial synthesis with suitable examples. | **10 Marks** | **L2** | **CO1** |
| **2** | What is Physical Vapor Deposition (PVD)? Explain the process and its applications in nanomaterial synthesis. | **10 Marks** | **L2** | **CO2** |
| **3** | What is the hydrothermal method for synthesizing nanomaterials? Explain its advantages and limitations. | **10 Marks** | **L2** | **CO3** |
| **4** | Design an experiment to demonstrate the impact of particle size on the optical properties of nanomaterials. Outline the procedure, materials needed, and the expected results. | **10 Marks** | **L3** | **CO3** |
| **5** | Discuss the structure and properties of carbon nanotubes. How do their unique properties make them suitable for various applications? | **10 Marks** | **L4** | **CO1** |
| **6** | Compare the merits and demerits of nanoparticles in industrial applications. | **10 Marks** | **L4** | **CO2** |

**Part B**

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| **Answer the Questions. Each question carries 20 marks 2Q x 20 = 40 Marks** | | | | | |
| **7.** | **a.**  **b.** | Discuss any three chemical routes for the synthesis of nanomaterials in detail with diagram.  Discuss the principles, advantages, and limitations of each synthesis technique, and provide examples of specific nanomaterials synthesized using these methods. | **20 Marks** | **L4** | **CO 1 &2** |
|  | | | | | |
| **8.** | **a.** | Explain the concept of Nano sensors and their significance. Discuss the types of Nano sensors used in healthcare and industrial monitoring with examples. | **20 Marks** | **L3** | **CO3** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***