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



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

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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. | Briefly write the history of nanomaterials. | CO1 | 4 |
| b. | Demonstrate the sol-gel process for the preparation of Nanoparticles. | CO1 | 12 |
| c. | List out the challenges in nanotechnology. | CO1 | 4 |
| **(OR)** | | | | |
| 2. | a. | Explain the following terms:  i) Quantum dots ii) Dimension of Nanomaterials iii) spinels  iv) surface area volume ratio v) Piezoelectric effect. | CO1 | 10 |
| b. | Elaborate the instrumentation and fabrication of nanparticle by Ball milling. | CO1 | 10 |
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| 3. | a. | Explain the mechanism involved in the synthesis of Nanofilm via vapour deposition. | CO1 | 6 |
| b. | Write a short note on sputtering. | CO1 | 6 |
| c. | Explore the mechanism of Silicon Nanowire synthesis via Vapour-Liquid-Solid Process. | CO1 | 8 |
| **(OR)** | | | | |
| 4. | a. | With neat sketch, give the components and their functions in Molecular Beam Epitaxy. | CO1 | 12 |
| b. | Discuss the synthesis of nanowires through electrospinning method. | CO1 | 8 |
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| 5. | a. | Demonstrate the synthesis of carbon nanotube by chemical vapour deposition. | CO1 | 10 |
| b. | Give the properties and applications of Graphene. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | Define: i) Fullerene. ii) allotropes of Carbon. | CO1 | 4 |
| b. | Explain the synthesis of Graphene via exfoliation method. | CO1 | 10 |
| c. | Point out the structural features and properties of C60. | CO1 | 6 |
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| 7. | a. | With neat sketch, explain the components of Atomic Force Microscope. | CO1 | 10 |
| b. | Discuss the various processes involved in photolithography. | CO1 | 10 |
| **(OR)** | | | | |
| 8. | a. | Define Tunneling Current and explain its application in Scanning Tunneling microscope. | CO1 | 2+8 |
| b. | Outline the principle, applications and limitations of Transmission Electron Microscope | CO1 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | “Nanomaterials are Next generation Materials”. Justify. | CO2 | 10 |
| b. | Eloborate the applications of the Magnetic nanoparticles in various fields. | CO2 | 10 |