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 – April/May– 2017**

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| **Code :** | **14NT2001** | **Marks :** | **100** |
| **Sub. Name :** | **FUNDAMENTALS OF NANOTECHNOLOGY** | **Duration :** | **3hrs** |

**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 about the various scientist involved in evolution of nanotechnology. | CO1 | 15 |
| b. | What happens to melting point, band gap and surface to volume ratio at nanolevel. | CO2 | 5 |
| (OR) | | | | |
| 2. | a. | Explain in detail about top-down and bottom-up approach with an example. | CO1 | 15 |
|  | b. | Name any 5 characterization techniques used to measure the properties of nanoparticles. | CO3 | 5 |
| 3. |  | Discuss the electrical, mechanical, physical and transportation properties of CNT in detail. | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Draw the schematic diagram of SEM and explain the various components. | CO3 | 10 |
|  | b. | What are various signals emitted from the sample in SEM. | CO3 | 5 |
|  | c. | Difference between SEM and TEM. | CO3 | 5 |
| 5. |  | Write a note on various imaging modes used in SEM. | CO3 | 20 |
| (OR) | | | | |
| 6. | a. | What are the scientific breakthroughs that may be enabled by nanotechnology. | CO1 | 10 |
|  | b. | Explain in detail the various criteria of Clean room. | CO2 | 10 |
| 7. | a. | Write a note on modified Hummer’s method for preparation of Graphene oxide. | CO2 | 10 |
|  | b. | Explain in detail what is molecular self-assembly with an example. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss the various ways in which cancer can be detected and diagnosed using nanotechnology. | CO2 | 10 |
|  | b. | With a neat diagram explain the working principle of AFM. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. |  | Schematically explain the the synthesis of CNT using the following methods  i.Arc discharge  ii. LASER ablation  iii. CVD | CO2 | 20 |