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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **15PH3015** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PHYSICS OF NANOMATERIALS** | **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. | With suitable sketch differentiate 0D, 1D and 2D structures. | CO1 | 5 |
| b. | Define density of states .Derive the density of states equation for 2D system. | CO1 | 15 |
| (OR) | | | | |
| 2. | a. | Define self assembly. | CO2 | 3 |
| b. | What is colloidal dispersion. | CO2 | 4 |
| c. | Define the process of flocculation. | CO2 | 3 |
| d. | Differentiate organosols and hydrosols. | CO2 | 10 |
| 3. |  | Explain in detail, the process of self-assembly differentiating monolayers and multilayers, with suitable examples | CO2 | 20 |
| (OR) | | | | |
| 4. | a. | Discuss in detail about quantum wells and superlattice. | CO1 | 15 |
|  | b. | Write short notes on Oswald ripening. | CO2 | 5 |
| 5. | a. | With suitable sketch explain in detail, the various structures of carbon nanotubes. Mention its effects on the properties of CNTs.. | CO2 | 15 |
|  | b. | Explain in detail, the vibrational properties of CNTs. | CO2 | 5 |
| (OR) | | | | |
| 6. |  | Explain in detail, the mechanical properties of CNTs based on Young’s modulus and Tensile strength. Justify how it varies compared to steel. | CO2 | 20 |
| 7. | a. | What is an Esaki diode? Explain in detail, how it differs from an ordinary P-N junction diode. | CO3 | 15 |
|  | b. | Write short notes on quantum Hall effect. | CO2 | 5 |
| (OR) | | | | |
| 8. |  | Explain the principle and working of a single electron transistor. | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain the phenomenon of magneto resistance. Mention its applications. | CO2 | 5 |
|  | b. | What is meant by Giant Magneto Resistance? How does its differ from magneto resistance? Why is it useful? | CO3 | 15 |

ALL THE BEST