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 :** | **14EC2075** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NANO ELECTRONICS** | **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. | Write schrodinger wave equation for electron. | CO1 | 4 |
| b. | Explain different types of transistors based on leakage current control and explain its operation detail. | CO1 | 16 |
| (OR) | | | | |
| 2. | a. | List out the electrical parameters involved in nanodevice analysis. | CO1 | 4 |
| b. | Discuss the various types of physical fundamentals in nanoelctronics and also explain the limits of integrated electronics? | CO1 | 16 |
| 3. | a. | Why MOSFET is called a field effect transistor? | CO1 | 4 |
|  | b. | Discuss in detail about tunnel effect and explain the tunneling process with an example. | CO1 | 16 |
| (OR) | | | | |
| 4. | a. | What is mean by vertical MOSFET? Explain the same in detail? | CO1 | 4 |
|  | b. | Explain the operation of resonant tunneling diode in detail with relevant diagrams? | CO1 | 16 |
| 5. | a. | Differentiate between quantum dot and quantum wire. | CO2 | 4 |
|  | b. | Define Electron spin Transistors? Explain the operation of the spin transistor in detail. | CO3 | 16 |
| (OR) | | | | |
| 6. | a. | List various types of quantum structures with different dimensions. | CO3 | 4 |
|  | b. | Explain various types of optoelectronic integrated circuits with its operational principles. | CO3 | 16 |
| 7. | a. | What is mean OEIC and list few applications of OEIC? | CO2 | 4 |
|  | b. | Explain the operation of multigate transistor with neat diagram? | CO2 | 16 |
| (OR) | | | | |
| 8. | a. | List the applications of integrated optoelectronics | CO3 | 4 |
|  | b. | Draw the various types of molecular memory structure and explain its operation in detail. | CO3 | 16 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Write the steps involved in the synthesis of carbon nanotubes?. | CO2 | 4 |
|  | b. | With a neat sketch explain the working principle of CNT Field effect transistors? | CO2 | 16 |

**Course Outcome:**

CO1: The students will understand the concepts of nano regime such as coloumb blockade , electron tunnelling and the necessity of Nanodevices.

CO 2: They will know the domains in which nanodevices play a major role and are inevitable.

CO3: They would be able to widen their knowledge about spintronic devices.

ALL THE BEST