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



**End Semester Examination – Nov/Dec – 2017**

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| **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. |  | Describe various types of physical fundamentals in nanoelectronics and infer its importance in detail? | CO1 | 20 |
| (OR) | | | | |
| 2. | a. | Illustrate tunnel effect and demonstrate the tunneling process with an example. | CO1 | 12 |
| b. | Analyze the scaling issues present in nanoelectronic devices | CO1 | 8 |
|  |  |  |  |  |
| 3. | a. | Discriminate the difference between Vertical MOSFET and Horizontal MOSFET. | CO2 | 6 |
|  | b. | Sketch a 14nm Vertical MOSFET and criticize its design parameters in detail. | CO2 | 14 |
| (OR) | | | | |
| 4. | a. | Develop a Resonant tunneling diode with NDR principle in nanoelectronics and infer its operations in detail? | CO2 | 14 |
|  | b. | Give the advantages of nanodevices in semiconductor industry | CO1 | 6 |
|  |  |  |  |  |
| 5. | a. | Design Single Electron Transistor in nanoelectronics and analyze its principles in detail. | CO2 | 14 |
|  | b. | Comparison between FET and SET design in nanoelectronics. | CO1 | 6 |
| (OR) | | | | |
| 6. | a. | Illustrate the need of quantum electronic devices and Infer split gate transistor using its quantum structure. | CO3 | 14 |
|  | b. | Analyze the electrical parameters considered for the overall performance of transistors. | CO1 | 6 |
|  |  |  |  |  |
| 7. | a. | Develop electronic, optical device on a slicon(Si) substrate and criticize its importance in OEIC current trends. | CO2 | 18 |
|  | b. | Differentiate OEIC and MMIC in electronic systems. | CO2 | 2 |
| (OR) | | | | |
| 8. | a. | Analyze the operation of switches based on molecular electronics element in detail. | CO1 | 10 |
|  | b. | Write the operation of carbon tube transistor with neat two dimensional diagram with one application in detail. | CO1 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Describe physical synthesis in nanoelectronics? Explain the process steps involved in physical synthesis method of CNT with neat diagram. | CO2 | 20 |

ALL THE BEST