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



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

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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. | a. | Paraphrase the physical fundamentals in nanoeletronics and also explain the limits of integrated electronics. | CO1 | 16 |
| b. | State schrodinger wave equation. | CO1 | 4 |
| **(OR)** | | | | |
| 2. | a. | Construct the band diagram of resonant tunneling diode and discuss the operation with the help of I-V characteristics. | CO1 | 16 |
| b. | Differentiate BJT and MOSFET. | CO1 | 4 |
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| 3. | a. | Explain the principle of Single electron transistor in detail and state its advantages over FET. | CO2 | 16 |
|  | b. | Why MOSFET is called as field effect transistor? Write the expression for drain current in the saturation region. | CO2 | 4 |
| **(OR)** | | | | |
| 4. |  | Explain about Resonant tunneling diode (RTD) with relevant characteristics diagrams. | CO2 | 20 |
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| 5. |  | Analyze the Quantum Electronic Device (QED) in detail with relevant diagrams and mathematical expressions. | CO2 | 20 |
| **(OR)** | | | | |
| 6. | a. | Summarize briefly on electron wave transistor and split gate transistor with its operation. | CO2 | 14 |
| b. | Write short notes on Quantum Well, Wires and Dots. | CO2 | 6 |
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| 7. |  | Demonstrate the types of metal contacts with suitable examples. | CO2 | 20 |
| **(OR)** | | | | |
| 8. | a. | Explain the operation of switch using Fullerenes and nanotubes. | CO2 | 16 |
| b. | List the configurations in molecule structures. | CO2 | 4 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the working principle of CNT Field effect transistors with neat diagram. | CO3 | 16 |
| b. | Enumerate the steps involved in the synthesis of carbon nanotubes. | CO3 | 4 |