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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17NT3002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NANOELECTRONICS** | **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. | Design and discuss about the various electrical parameters of a transistor by considering it as a black box. | CO1 | 10 |
| b. | Elaborate the working principle of Nano CMOS with its circuit diagram. | CO4 | 10 |
| (OR) | | | | |
| 2. |  | Explain about Quantum cellular automate with various configuration includes wire, inverter and other logical gates? | CO5 | 20 |
|  |  |  |  |  |
| 3. | a. | Describe about the High Electron Mobility Transistor with its schematic diagram. | CO5 | 10 |
| b. | Discuss about the Silicon on Insulator technology with neat diagram. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Compare about the various scaling methods followed for the design of short channel transistor. | CO1 | 10 |
| b. | Discuss about calorimetric sensors with neat diagram. | CO3 | 10 |
|  |  |  |  |  |
| 5. |  | Explain about the tunnelling element technology (Tunnel Diode) and describe about Resonant Tunnelling diode with its I-V characteristics. | CO5 | 20 |
| (OR) | | | | |
| 6. | a. | Elaborate the working principles of High Electron Mobility Transistor. | CO5 | 10 |
| b. | Analyze about various short channel effects in detail with band diagram. |  | 10 |
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| 7. | a. | Elaborate the working principle of Nanotubes based sensors with its neat diagram. | CO2 | 10 |
| b. | Explain about the Super Capacitor as an energy storage devices, with neat diagram explain its working principle? | CO4 | 10 |
| (OR) | | | | |
| 8. | a. | Brief about the Molecular electronics and explain about the molecular devices with its structures. | CO6 | 10 |
| b. | Write short note on spin transistor. | CO2 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Explain the working of Single Electron Transistor with neat diagram and with the help of Coulomb blockade. | CO3 | 20 |