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

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

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| **Code :** | **16NT3013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NANOSCALE TRANSISTORS** | **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. | Compare about the various scaling methods followed for the design of short channel transistor. | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | Describe about the short efforts with energy band diagram and also discuss about the Voltage-Doping Transformation model (VDT). | CO2 | 10 |
| b. | Discuss in detail about modeling of MOSFET current voltage (I-V) characteristics in related with resistor and current source characteristics curves. | CO1 | 10 |
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| 3. | a. | Discuss in detail about the mobility and strain engineering of Fin FET. | CO3 | 10 |
| b. | Compare diffusion and ballistic transport of electron in a channel. | CO3 | 10 |
| (OR) | | | | |
| 4. |  | Explain in detail about Gate patterning of Multi gate MOSFET with its electrical analysis. | CO3 | 20 |
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| 5. | a. | Elaborate about the fabrication concept of Fully Silicided Metal Gate (FUSI) with neat diagram. | CO4 | 10 |
| b. | Discuss about Silicon-On-Insulator in detail with neat diagram | CO4 | 10 |
| (OR) | | | | |
| 6. |  | Discuss the fabrication of the Tri-gate MOSFET and 4T-MuGFET with neat diagram. | CO3 | 20 |
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| 7. | a. | Explain about the less than of 45 degree angle method of fabrication of source and drain with neat diagram. | CO4 | 10 |
| b. | Discuss about the electrical and mechanical property analysis of GAA. | CO6 | 10 |
| (OR) | | | | |
| 8. | a. | Explain in detail about the various contacts to the Fin FET with neat diagram | CO3 | 10 |
| b. | Explain about the Gate Geometry and Electrostatic Integrity of the various structures of nano scale transistor. | CO6 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Elaborate the function of gate all around transistor with its various high –K gate dielectric materials. | CO5 | 10 |
| b. | Discuss in detail about the gate all around transistor with its various channel materials. | CO5 | 10 |