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

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

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| **Code :** | **14EC2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTRON DEVICES** | **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. | Determine an equation for electron concentration (n0) under thermal equilibrium condition with neat diagram. | CO1 | 10 |
| b. | Find the probability that a state in the conduction band is occupied by an electron and calculate the thermal equilibrium electron concentration in Si at T=300K. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Illustrate the position of the Fermi energy level as a function of the doping concentrations and as a function of temperature with neat diagram. | CO1 | 15 |
| b. | Write short notes on Compensated semiconductors. | CO1 | 5 |
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| 3. | a. | Explain the principle of Hall effect and derive the expression of Hall voltage and Hall coefficient. | CO1 | 10 |
| b. | With neat diagrams, explain the different methods of carrier generation and recombination. | CO1 | 10 |
| **(OR)** | | | | |
| 4. | a. | Explain the following:  i) Transition Capacitance               ii) Diffusion Capacitance. | CO1 | 10 |
| b. | Explain the working principle of Zener diode under forward and reverse biased conditions with its volt-ampere characteristics. | CO2 | 10 |
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| 5. | a. | Find an expression for barrier potential (Eo) under open circuited PN junction with diagram. | CO2 | 15 |
| b. | Define the following terms:  i) Cut-in voltage ii) Break down voltage. | CO2` | 5 |
| **(OR)** | | | | |
| 6. | a. | Explain the operation, input and output characteristics of NPN transistor in CE configuration with neat diagram. | CO2 | 15 |
| b. | Compare BJT, JFET and MOSFET. | CO2 | 5 |
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| 7. | a. | Discuss the construction, operation and characteristics of Depletion type MOSFET with diagram. | CO2 | 15 |
| b. | Give the VI characteristics of DIAC. | CO2 | 5 |
| **(OR)** | | | | |
| 8. | a. | Explain the operation of JFET with necessary diagram. Also mention the applications of the same. | CO2 | 15 |
| b. | What are the applications of tunnel diode. | CO3 | 5 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain the construction and operation of silicon controlled rectifier with necessary circuit diagram. Also list out its applications. | CO3 | 10 |
| b. | With neat diagram, explain the construction and operation of LED. Also mention its advantages. | CO2 | 10 |