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



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

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| **Code :** | **17EC2002** | **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. | Derive an expression for electron concentration n0 in intrinsic semiconductor with a neat energy band structure. | CO1 | 10 |
| b. | With the energy band structure, derive the mathematical equation for hole concentration p0 in a compensated semiconductor. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Explain in detail about methods of generation and recombination of charge carriers in semiconductors. | CO2 | 15 |
| b. | Compute the electron density in Silicon, if the Fermi level is at 0.55 eV below the conduction band edge. Assume T = 300 K(Nc=2.8×1019 cm-3). | CO1 | 5 |
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| 3. | a. | Draw the small signal model of PN diode and define the circuit parameters asscociated with the model. | CO3 | 12 |
| b. | What will happen to the position of the Fermi level, when excess carriers are created in a semiconductor? | CO1 | 8 |
| **(OR)** | | | | |
| 4. | a. | Explain the construction, working principle and applications of PN diode with necessary diagrams. | CO3 | 15 |
| b. | Express the current components of PN diode with neat diagram. | CO3 | 5 |
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| 5. | a. | Outline the construction details of Bipolar Junction Transistor. | CO3 | 5 |
| b. | Describe the operation of NPN and PNP transistors. | CO3 | 15 |
| **(OR)** | | | | |
| 6. | a. | Compare the performance of a transistor in different configurations. | CO3 | 5 |
| b. | Make use of the laboratory setup diagram and explain the static characteristics of common-emitter configuration. | CO3 | 15 |
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| 7. | a. | With neat diagrams, explain the structure, operation and characteristics of N-channel JFET. | CO3 | 15 |
| b. | Compare JFET and MOSFET. | CO5 | 5 |
| **(OR)** | | | | |
| 8. |  | Explain in detail the construction, equivalent circuit, working and characteristics of SCR. | CO4 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Elaborate the construction, operation, volt-ampere characteristics of tunnel diode. | CO4 | 10 |
| b. | Describe the operation of TRIAC and its characteristics. | CO4 | 10 |