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

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

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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 the Fermi level expression in an intrinsic semiconductor. | CO1 | 10 |
| b. | Discuss the effect of Fermi-Dirac probability distribution function at different temperature levels. | CO1 | 10 |
| (OR) | | | |  |
| 2. | a. | Derive the continuity equation from the first principle and also derive three special cases of continuity equation. | CO1 | 15 |
| b. | What is hall effect and what is the use of hall effect? | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | Derive the electron concentration expression in an intrinsic semiconductor. | CO2 | 10 |
| b. | Compare Intrinsic and Extrinsic semiconductors with suitable example. | CO2 | 5 |
| c. | Illustrate the law of electrical neutrality? | CO2 | 5 |
| (OR) | | | |  |
| 4. | a. | Derive the expression for diode current equation. | CO3 | 10 |
| b. | What is transition capacitance and derive the expression for transition capacitance. | CO3 | 10 |
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| 5. | a. | Outline the energy band structure of open circuited PN diode and also derive the expression for contact potential Vo. | CO3 | 15 |
| b. | Explain the current components of a PN diode. | CO3 | 5 |
| (OR) | | | |  |
| 6. | a. | Explain the construction, operation and characteristics of depletion MOSFET. | CO4 | 10 |
|  | b. | Describe the common source characteristics of JFET. | CO4 | 10 |
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| 7. |  | Analyze how the semiconductor devices like BJT, FET and MOSFET can be used for designing VLSI circuits. | CO5 | 20 |
| (OR) | | | |  |
| 8. |  | Design simple applications using PN diode and Zener diode. | CO6 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain the construction and working of NPN transistor with neat sketch. | CO4 | 10 |
| b. | Discuss the h- parameter model of BJT. | CO4 | 10 |