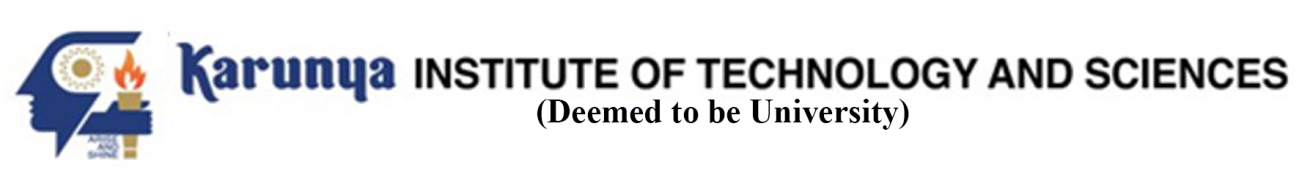
Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



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

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| **Code :** | **14EC2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTRON DEVICES** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Derive an equation for hole concentration (p0) under thermal equilibrium condition with neat diagram. | CO1 | 15 |
| b. | Calculate the thermal equilibrium hole concentration in Silicon at T=400K. Assume the fermi energy is 0.27eV above the valence band energy. The value of Nv for Si at T=300K is 1.04x1019 cm-3. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Derive an equation for n0 in Charge neutrality  with neat diagram. | CO1 | 15 |
| b. | Write short notes on Compensated semiconductors. | CO1 | 5 |
|  |  |  |  |  |
| 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. Drift current                       ii.         Diffusion Current | CO1 | 10 |
| b. | Explain the working principle of PN diode under forward and reverse biased conditions with its volt-ampere characteristics. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | With neat diagram, derive the expression for barrier potential (Eo) under open circuited PN junction with diagram. | CO2 | 15 |
| b. | If the reverse saturation current in a pn junction silicon diode is 1nA,find the applied voltage for a forward current 1µA. | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | With neat diagrams, explain the operation, input and output characteristics of NPN transistor in CE configuration. | CO2 | 15 |
| b. | Compare CE,CB and CC configurations. | CO2 | 5 |
|  |  |  |  |  |
| 7. | a. | Explain the construction, operation and characteristics of Enhancement MOSFET with neat diagram. | CO2 | 15 |
| b. | Give the VI characteristics of UJT. | 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 varactor 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 |