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

G:\logo and QP Template\logo 3 Feb 2018 final.tif

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

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **17PH2004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SEMICONDUCTOR PHYSICS-II** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Classify the materials based on energy bands and give details about them. | CO1 | 5 |
| b. | Discuss the formation of PN junction with neat sketch. | CO1 | 5 |
| c. | Elucidate the characteristics of PN junction diode under  i. Forward bias.  ii. Reverse bias. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | What is a rectifier? Explain the action of a Full-wave rectifier with suitable illustrations. | CO2 | 12 |
| b. | Define the terms Ripple and Peak Inverse Voltage. | CO2 | 3 |
| c. | Compare half-wave, full wave and bridge rectifiers. | CO2 | 5 |
|  |  |  |  |  |
| 3. | a. | What is a BJT? Explain the operation of NPN and PNP transistors. | CO3 | 10 |
| b. | Explain the construction and working of JFET. | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | What is a MOSFET? What are the types of MOSFET? | CO3 | 5 |
| b. | Elaborate the circuit operation of D-MOSFET in both modes. | CO3 | 15 |
|  |  |  |  |  |
| 5. |  | Describe SCR. With the help of V-I characteristics clarify the working principle of an SCR. | CO3 | 20 |
| (OR) | | | | |
| 6. |  | How the tunneling effect takes place in tunnel diode? Demonstrate the preparation and working of tunnel diode using V-I characteristics. | CO3 | 20 |
|  |  |  |  |  |
| 7. | a. | Enlighten the construction and working principles of Light Emitting Diode with necessary figures. | CO4 | 10 |
| b. | Give details about the advantages, preparation and working of Liquid Crystal Display. | CO4 | 10 |
| (OR) | | | | |
| 8. |  | Draw the equivalent circuit of UJT and explain its operation with the help of emitter characteristics. | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the working principle of optocouplers with neat diagram. | CO5 | 8 |
| b. | Discuss in detail about the Digital instruments and its applications. | CO6 | 12 |