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

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

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| **Code :** | **14PH2019** | **Duration :** | **3hrs** |
| **Sub. Name :** | **CONDENSED MATTER PHYSICS** | **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. | Briefly describe lattice vibrations in a crystal solid. | CO1 | 4 |
| b. | Illustrate ionic polarization and electronic polarization in detail. Discuss various applications of polarization in solids. | CO1 | 16 |
| (OR) | | | | |
| 2. | a. | Write a short note on dielectrics. | CO1 | 4 |
| b. | Based on the band theory of solids discuss the occurrence of energy gap in a semiconductor and mention its importance in solids. | CO1 | 16 |
|  |  |  |  |  |
| 3. | a. | Define the term Fermions in solids. | CO1 | 4 |
| b. | Explain Weiss theory of ferromagnetism in detail to find the spontaneous magnetization under critical temperature. | CO1 | 16 |
| (OR) | | | | |
| 4. | a. | Write a short note on ferromagnetic domains | CO2 | 4 |
| b. | Derive Classius-Mosotti relation to relate the macroscopic dielectric constant with microscopic polarizabilities. | CO2 | 16 |
|  |  |  |  |  |
| 5. | a. | Briefly describe dielectric polarization. | CO2 | 4 |
| b. | Explain Langevin’s theory of paramagnetism in detail. | CO2 | 16 |
| (OR) | | | | |
| 6. | a. | Write a short note on hysteresis curve. | CO2 | 4 |
| b. | Compare and contrast the properties and concepts of Dia, Para, ferro and antiferro magnetic materials with necessary diagram | CO2 | 16 |
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| 7. | a. | How color centres affects the properties of a crystal solid? | CO3 | 4 |
| b. | Discuss various crystal defects. Summarize the different types of point defects in crystals with examples. | CO3 | 16 |
| (OR) | | | | |
| 8. | a. | Briefly describe Josephson effect. | CO3 | 4 |
| b. | Explain the process of excitation and emission mechanism of electroluminescence and thermoluminescence in detail. Discuss its applications. | CO3 | 16 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain Meissner effect and its effect in magnetic levitation. | CO3 | 4 |
| b. | Illustrate the main postulates of BCS theory of superconductors and its phenomena in detail. | CO3 | 16 |