

## **Assignment**

### **Solid state**

#### **PG 3<sup>rd</sup> Semester**

**Total Marks: 50**

1. Discuss the influence of change in particle size and shape on semiconductor band gap. 3
  2. What are the different types of carbon nanomaterials? Write briefly about the applications of carbon nanomaterials. 4
- Or**
- Discuss briefly the structure of different types of carbon nanomaterials.
3. What is electroluminescence? Draw the common circuit diagram of LED. Discuss the working principle of an LED. Why LEDs are generally forward biased? 5
  4. Give a comparative study of organic and inorganic semiconductors. 4
  5. Explain briefly how the shape memory alloys work. 3
  6. Define organic semiconductors. Explain the structural features, charge-transport mechanisms and key factors that govern the electronic properties of organic semiconductors. 5
  7. What are smart materials? Discuss various components of smart materials with suitable example. 4
  8. What are liquid crystals? What distinguishes them from conventional liquids and solids in terms of molecular order? 3
  9. How can the principle of material design be applied to develop new materials that address contemporary economic and environmental challenges? Discuss key strategies with suitable examples. 5
  10. What is conducting polymer? Give examples of two conducting polymers. 3
  11. Discuss briefly the components of OLED. 3
  12. Briefly compare the mechanical properties of metals, ceramics and polymers. 3
  13. Discuss the Meissner effect in superconductors. How does this effect distinguish superconductors from perfect conductors? 5