Roll No……..….. **Total No. of Printed Pages: 1**
Total No. of Questions: [11]

M.Sc. (Physics) (Semester – 4th)
PHYSICS OF MATERIALS
Subject Code: MPHYS1462
Paper ID: 18220720

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It carries 16 marks. It consists of 4 questions of 4 marks each.
2. Section B consist of 4 questions of 8 marks each. The student has to attempt any 3 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(4 marks each)**

Q1. Compare soft and hard magnetic materials.

Q2. Write short note on polymer-matrix composites.

Q3. Discuss in brief energy band gap of nanomaterials.

Q4. What is fracture of polymers? Explain briefly.

Section – B **(8 marks each)**

Q5. Discuss mechanical behavior of polymers- macroscopic and viscoelastic deformation

Q6. What are nanomaterials? Write important applications of nanomaterials.

Q7. What are ferroelectric and piezoelectric materials? Discuss their applications.

Q8. What is matrix phase? Discuss metal-matrix composites with their uses.

Section – C **(10 marks each)**

Q9. Discuss thermal properties of materials such as heat capacity, thermal expansion, thermal conductivity and thermal stresses. Write their units of measurement.

Q10. What are carbon nanotubes? Describe their synthesis methods and properties.

Q11. What are ceramic- matrix composites? Explain crystallization, melting and glass transition phenomena in polymer materials.