

Mid-West University
Examinations Management Office
End Semester Examinations 2081

Master level/ M.Sc.(Physics)/ 3rd Semester
Time: 3 hours
Subject: **Material Science I (PHY615)**

Full Marks: 37.5
Pass Marks: 18.75

Candidates are required to give their answer in their own words as far as Practicable. The figures in the margin indicate full marks.

Attempt all the questions:

1. Differentiate between metal and non-metals based on their optical properties. Discuss applications of optical phenomena of non-metals. Also explain about the construction and working of semiconductor laser. [10]
2. What do you mean by phase transformation in solid materials? Explain the role of nucleation and growth in phase transformation. Explain the transformation of steel, solidification and crystallization of solid based on nucleation and growth.

OR

Describe the working principle and construction of optical fiber. Also describe its role in communication with important advantage and disadvantages. [10]

3. Explain the process of data storage on magnetic medium hard disc drive and magnetic tapes.

OR

What do you mean by stability and meta-stability? Explain the basic thermodynamics functions associated with pressure and temperature play the vital role in material science. [5]

4. Define Elastic, An-elastic and Viscoelastic behavior of solid materials. Also explain the atomic model of elastic behavior of solid materials. [5]
5. Differentiate between electronic polarization and electron energy transitions. Also discuss the important properties which distinguish the metal and nonmetals. [5]
6. Classify the solid materials. Also explain that how the advanced solid materials are used in daily life.

OR

Explain the statistical nature of entropy on solid materials? [2.5]

The End