

22/5/19 (5)  
(10)

Exam.Code:1015  
Sub. Code: 7762

1059

M.E. (Mechanical Engineering)  
Second Semester  
MME-203: Advances in Engineering Materials

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt any five questions.

x-x-x

- I. a) Explain the various crystal structural defects and also discuss their effects on properties.  
b) What is residual stress? Explain the steps in residual stress measurement. (5,5)
- II. a) Explain the image formation system in the scanning electron microscope.  
b) Explain the construction and working principle of optical microscope. (5,5)
- III. a) What is secondary electron? Explain backscattered electron method in scanning electron microscope.  
b) Explain different electron gun. (5,5)
- IV. a) Explain the factors affecting the resolution of STM. Also compare constant height and current mode.  
b) Explain the construction and operation of TEM. (5,5)
- V. What is a synthetic polymeric material? Explain different synthetic polymeric materials and write their applications. (10)
- VI. a) What is actuating materials? Explain any two actuating materials.  
b) What is a nano material? Explain various methods of production. (5,5)
- VII. a) Explain dual-purpose materials with suitable example  
b) Write the advantages and disadvantages of shape memory alloy. (5,5)
- VIII. Name various varistors and intelligent materials and explain. (10)

x-x-x