

S.Y.M.Sc.(Physics) (CBCS Pattern) Sem IV
PSCPHYT15.1-Paper-XV (Core Elective E 2.1) Material Science-II

P. Pages : 1

Time : Three Hours



GUG/S/18/20175

Max. Marks : 80

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1. Either
- a) Explain elastic behaviour of solid using atomic model and show that it depends on the type of bonding. 8
 - b) Peierls-Nabarro relation to discuss the mechanical behaviour of materials. 8
- OR**
- e) What are the methods to protect materials against corrosion? 8
 - f) Discuss construction, working and applications of GMR and CMR materials. 8
2. Either
- a) Discuss the concept of equilibrium & non-equilibrium processing. How it affects materials synthesis? 8
 - b) How TiO_2 produced using gas evaporation technique? 8
- OR**
- e) What are the physical top down and bottom up methods for synthesis of nano-crystalline solids? 8
 - f) Explain the fundamentals of reduction method and thermal decomposition method. 8
3. Either
- a) What do you meant by sintering? What is it's need in materials processing? 8
 - b) Why quenching is commonly adopted for formation of glass? 8
- OR**
- e) Explain quantitative phase analysis using a method that does not required standards. 8
 - f) Give the details of the factors, which are responsible for diffraction peak broadening. 8
4. Either
- a) Explain structural determination by fluorescent analysis. 8
 - b) What is the role of Rietveld refinement in structural analysis? 8
- OR**
- e) What is the working principle of XPS and how it is used for chemical analysis? 8
 - f) Obtain an expression for interplanar (hkl) distance 'd' for electron diffraction pattern (SAED) of TEM. 8
5. Attempt the following.
- a) Describe an elastic behaviour of solids. 4
 - b) What are DMS materials? 4
 - c) State Zachariasen rule of glass formation. 4
 - d) Describe how morphology of material is determined from SEM. 4
