PSCPHYT15.1 - Paper-XV - Core Elective- E2.1 : Material Science-II

P. Pages : 1

Time : Three Hours

1565

Max. Marks : 80

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Either :-

1. a) Explain the stress – strain curve with suitable example. Where this in used. **8**

    b) Peierls – Nabarro relation to discuss the mechanical behaviour of materials. **8**

    OR

    e) Explain the viscoelastic behaviour in solids. **8**

    f) Discuss design parameter Hardness, yield strength, ductility and yield toughness. **8**

Either :-

2. a) Explain the combustion method for preparation of nano powder. **8**

    b) What are the physical top down and bottom up methods for synthesis of nanocrystalline solids. **8**

    OR

    e) How the nanocrystalline solid are obtained using Hydrothermal process? Give example. **8**

    f) Discuss the concept of equilibrium and non-equilibrium processing and their importance in material science. **8**

Either :-

3. a) Explain the determination of crystallite size of powder using x-ray powder diffraction and discuss advantages and disadvantages. **8**

    b) What do you mean by sintering? What is it's need in materials processing. **8**

    OR

    e) How the glasses are formed? Give at least two examples. **8**

    f) Discuss the fundamentals of x-ray powder diffraction, electron diffraction and neutron diffraction method of phase analysis. **8**

Either :-

4. a) Explain structural determination by fluorescent analysis. **8**

    b) Explain construction & working principle of TEM. **8**

    OR

    e) What is the working principle of XPS and how it is used for chemical analysis? **8**

    f) Explain Warren – Averbach's Fourier method. **8**

5. Attempt **all** the following.

    a) Explain young modulus and shear modulus. **4**

    b) Discuss the details of ball milling technique to obtain nanopowder. **4**

    c) Write a note on Quenching. **4**

    d) Describe how morphology of material is determined from SEM. **4**

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