M.Sc. S.Y. (Physics) (CBCS Pattern) Semester-IV

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

P. Pages : 2 **GUG/W/24/11415**

Time : Three Hours * 4 4 5 3 * Max. Marks : 80

Either:

1. a) Explain construction, working and applications of GMR and CMR materials. **8**

b) Peierls-Nabrro relation to discuss the mechanical behaviour of materials. **8**

OR

e) Explain corrosion and degradation of materials. **8**

f) Discuss design parameters stiffness, ductility, toughness and shear strength. **8**

Either:

2. a) Describe any two physical methods of synthesis. **8**

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

OR

e) Discuss colloidal and micellar approach of synthesis of nanostructured materials. **8**

f) Explain- **8**

i) Hydrothermal process

ii) Ball milling method

Either:

3. a) Discuss the basic elements of powder technology and sintering calcination. **8**

b) How the glasses are formed? Give atleast two examples. **8**

OR

e) Write a note on- **8**
Quenching process and concepts of glass formation.

f) Give the details of the factors, which are responsible for diffraction peak broadening. **8**

Either:

4. a) What information is contained in peak position, peak intensity and peak shape of X-ray diffraction pattern? **8**

b) How XRD data are used to determine particle size of polycrystalline materials? **8**

OR

e) Explain construction and working of scanning electron Microscope. **8**

f) Explain importance of EDX and XPS for characterization of materials. **8**

5. Attempt all the followings.

a) Explain Young modulus and shear modulus of elasticity. **4**

b) Explain Lorentz cavity & its importance. **4**

c) Need of calcinations of materials in synthesis of materials. **4**

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

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