

M.Sc. S.Y. (Physics) (CBCS Pattern) Sem-III
PSCPHYT11-1 - Core Elective E-1.1 - Materials Science-I

P. Pages : 1

Time : Three Hours



GUG/W/22/11298

Max. Marks : 80

Either:

1. a) Explain stability and meta-stability in the context of Equilibrium and Kinetics. **8**
b) Discuss kinetics of thermally activated process. **8**

OR

- e) What is Phase rule? Explain Binary phase diagrams with eutectic system. **8**
f) Explain Lever principle, super lattice and miscibility gap. **8**

Either:

2. a) Explain in detail Phase transformation in materials & Time scale for phase changes? **8**
b) Write a note on: (i) Peritectic reaction and (ii) Eutectoid and deutectic transformations. **8**

OR

- e) Explain importance of dendritic structure in alloys. **8**
f) Explain transformation in materials on heating and cooling. **8**

Either:

3. a) What is meant by diffusion in solids? Explain Fick's law and their solutions. **8**
b) Explain diffusion of carbon in iron. **8**

OR

- e) Explain Arrhenius theory of ionic conductivity. **8**
f) What is Kirkendall effect? Describe mechanism of diffusion. **8**

Either:

4. a) Explain in detail about construction and working of solar cell. **8**
b) Explain detail about Solid oxide fuel cells and phosphoric acid fuel cells. **8**

OR

- e) What is Fuel cell? Explain advantages and disadvantages of fuel cell. **8**
f) Explain construction and working of proton exchange membrane fuel cell. **8**

5. Attempt all of the following.
- a) What are the Applications of zone refining? **4**
b) Explain growth kinetics **4**
c) Write a note on chemical sensors **4**
d) Write short note biochemical fuel cell. **4**
