QP CODE: 21000418

Reg No : .....

Name : .....

# M Sc DEGREE (CSS) EXAMINATION, MARCH 2021

## Third Semester

Faculty of Science

M Sc PHYSICS

## Elective - PH810301 - SOLID STATE PHYSICS FOR MATERIALS

2019 Admission Onwards

A6670946

Time: 3 Hours Weightage: 30

### Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What is meant by critical resolved shear stress?
2. Define surface imperfections
3. Write a short note on atomic packing
4. Define Fick's second law
5. Briefly explain the experimental procedure of the determination of Kirkendaal effect
6. What are covalent crystals?
7. Explain the formation of hydrogen bonds
8. Distinguish between unary and binary phase diagrams
9. Distinguish between large and small polarons?
10. Explain the quantization of spin waves in a ferrimagnet.?

(8×1=8 weightage)

## Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain the formation of Colour centres in alkali halides?
12. What is meant by dislocation energy?
13. Distinguish between polymorphism and polytypism
14. Explain the relation between diffusion and ionic conductivity in solids
15. Explain the formation of bonds in inert gases
16. Explain the method of calculation of the bond dissociation energy of NaCl molecule
17. Explain the longitudinal and transverse plasma oscillations
18. What are polarons? How they are created?

(6×2=12 weightage)

## Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. What is meant by point defects in crystal lattice? Explain different types of point defects with suitable examples.
20. Define the term: repulsive interaction, cohesive energy and equilibrium lattice constant
21. Discuss micro-structural changes during cooling using phase diagrams.
22. Explain the nature of excitons in a semiconductor. Plot the band diagram and the show the excitons energy levels in the energy level diagram.

(2×5=10 weightage)