
UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)
उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

M.Sc. Physics (MSCPHY13)

First Year Assignment

Last Date of Submission: 15 May 2015

Course Title: Solid State Physics

Course Code: PHY-503

Year : 2014-15

Maximum Marks :40

Section A

Section A contains 08 short answer type questions of 5 marks each. Students are required to answer 4 questions only. Answers of short answer type questions should be 250 words approximately.

- 1- What is difference between symmetry operation and symmetry element? Explain the point symmetries and translational symmetries in three dimensional crystals. Show that a crystal cannot possess a fivefold rotational symmetry.
- 2- What is glass transition temperature? Explain the relation between crystal, liquid and glass with the help of volume temperature graph.
- 3- Explain the concept of reciprocal lattice. And show that reciprocal of lattice of bcc is a fcc lattice.
- 4- Explain the principle of electron diffraction. What are the special characteristics of electron diffraction? Compare electron diffraction with X-ray diffraction.
- 5- What are intrinsic and extrinsic vacancies? How are extrinsic vacancies created in a crystal? Explain the effect of Schottky and Frenkel defects on the density of an ionic solid.
- 6- Explain Hall Effect in semiconductor and calculate hall field.
- 7- Explain Gruneisen parameter.
- 8- What is paramagnetism ? Explain the Curie Weiss law for paramagnetic material.

Section B

Section B contains 04 long answers type question of 10 marks each and students are required to answers 02 questions only.

- 1- What are assumptions and conclusions of Kronig Penney model explain in detail.
- 2- Explain the working of Nd:YAG laser and give its importance and application.
- 3- Obtain the various irrational mode of mono atomic chain of identical atoms under periodic boundary conditions.
- 4- What is dielectric constant? Explain the different techniques of dielectric measurements. Give some idea about dielectric materials.