PD-370-S.E.-CV-19

M.Sc. PHYSICS (3rd Semester)

Examination, Dec.-2020

Paper-III

CONDENSED MATTER PHYSICS-I

Time : Three Hours] [Maximum Marks : 80

[Minimum Pass Marks : 29

Note : Answer from both the Sections as directed. The figures in the right-hand margin indicate marks.

Section-A

1. **Answer the following questions:-** 1x10=10
   (a) **What is basis.**
   (b) **What do you understand by Milles indices.**
   (c) **What is the term susceptibility.**
   (d) **What are the total number of Bravais Lattices in a crystal structure.**
   (e) **What is Ewald's construction.**
   (f) **Give the definition of Defact in crystal.**
   (g) **What are magnetic Domains.**
   (h) **Which type of Material show hysteresis.**
   (i) **What is the unit of magnetic susceptibility?**
   (j) **What does 'F' stands for in word 'F centre'.**
2. **Answer the following questions:-** 2x5=10
   (a) **What is Magneto resistance. .**
   (b) **What is spin waves and magnons.**
   (c) **Define Burger's vector.**
   (d) **Define effective mass.**
   (e) **Explain Bragg's law.**

Section-B

15x4=60

Attempt all question.

UNIT-I

3. (a) **Derive laue's equation.**
   (b) **Prove that Reciprocal Lattice of BCC is a FCC Lattice.**

OR

(a) **Deference between crystalline and amorphous solids.**
(b) **What are the fundamental elements of symmetry? Explain and give the examples.**

UNIT-II

4. (a) **Explain colour center in ionic crystals.**
   (b) **Obtain elastic strain energy of screw dislocation.**

OR

What is defact? Explain Schottky defect in detail.

UNIT-III

5. (a) **Briefly explain the Band theory of solid.**
   (b) **Explain quantum Hall effect and give its importance.**

OR

Describe Kroning-Penney model.

UNIT-IV

6. (a) **Discuss in detail the Weiss theory of ferromagnetism.**
   (b) **Explain Ferro and Anti-Ferro magnetism.**

OR

(a) **Prove that susceptibility X is independent of temperature below Neel's temperature.**
(b) **What is Domain wall? Deduce an expression of Bloch wall energy of Ferro magnet.**