

Code No. : B03/101

Unit-IV

4. (A) What is Curie law ? 2
(B) What is exchange energy. 2
(C) Write short notes on any one from the following :
(a) Heiseberg Exchange Interaction,
(b) Ferrites and Iron Garnets. 4
(D) What is ferromagnetic material ? Explain its important properties and discuss domain theory. 12

Or

What is antiferromagnetic ordering ? Obtain magnon dispersion relations for antiferromagnetic material.



Roll No.

Total No. of Sections : 4

Total No. of Printed Pages : 4

Code No. : B03/101

III Semester Examination

M.Sc.
PHYSICS
Paper I

[Codensed Matter Physics]

Time : Three Hours]

[Maximum Marks : 80

[Min. Passing Marks : 16

Note : Part A and B of each question in each unit consists of Very Short Answer Type Questions which are to be answered in one or two sentences. Part C (Short Answer Type) of each question will be answered 200-250 words. Part D (Long Answer Type) of each question should be answered within the word limit 400-450.

Unit-I

1. (A) Define crystalline solids. 2
(B) What is crystal structure factor ? 2
(C) Prove that reciprocal lattice of fcc is bcc structure. 4

Code No. : B03/101

Or

Explain absorption of X-rays with matter.

- (D) What is bcc structure ? Calculate packing factor and coordination number for bcc structure. **12**

Or

Explain X-ray diffraction techniques by using rotating crystal method. Also give its importance and limitations.

Unit-II

2. (A) What are colour centres ? **2**
(B) What is line effect ? **2**
(C) What are defects ? Give broad classification of defects. **4**

Or

Differentiate screw dislocation and edge dislocations.

Code No. : B03/101

- (D) What are grain boundaries and stacking fault ? Explain it in detail with suitable examples and diagrams. **12**

Or

What are lattice vacancies ? Explain and also differentiate Frankel and Schottky defect with examples and sketches.

Unit-III

3. (A) What is Fermi energy surface ? **2**
(B) Define indirect band gap materials. **2**
(C) Write short notes on any one from the following :
(a) Brillouin zone
(b) Meissner effect **4**
(D) Explain quantization of orbits in detail and also discuss some characteristics of Fermi surface. **12**

Or

What are Cooper pairs ? Explain BCS theory in detail.