M.Sc.S.Y.(Physics)(with Credits)-Regular-Semester 2012 Sem IV

MSc24101 - Solid State Physics-II Paper-I

P. Pages : 1 **GUG/S/18/5800**

Time : Three Hours * 1 8 2 0 * Max. Marks : 80

Either

1. a) What is mean by defects? Explain different defects in solid crystal. **8**

b) Explain Burger's vector and Burger's circuit. Does the Burger's vector change the size of Burger's vector. Explain **8**

OR

e) What is meant by luminescence? Describe briefly the types of luminescence and explain the characteristics. **8**

f) Explain radiative and non radiative transition in Luminescence. **8**

Either

2. a) Discuss dielectric loss and relaxations in solid. **8**

b) Explain dielectric response of electron gas. **8**

OR

e) Derive relation between exchange integral and exchange field constant. **8**

f) Discuss Weiss theory of ferromagnetism. **8**

Either

3. a) Explain experimental arrangement to study NMR. **8**

b) What is the basic principle of Mossbauer effect? Explain working of Mossbauer spectrometer. **8**

OR

e) Explain the principle and working of ESR spectrometer. **8**

f) Discuss applications of ESR spectroscopy. **8**

Either

4. a) Explain Type – I and Type – II super conductors. Derive London equation. **10**

b) Discuss BCS theory of super conductivity. **6**

OR

e) What is Meissner effect? Show how London equations lead to this effect. **8**

f) Describe microwave and infrared properties of superconductivity. **8**

5. Attempt all the following.

a) What is thermal quenching? **4**

b) What are spin waves? Show that magnon frequency is directly proportional to wave vector. **4**

c) Discuss the applications of NMR. **4**

d) Explain the dc Josephson effect. **4**

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