Roll No.	Total No. of Pages : 02
Γotal No. of Questions:11	
M.Sc. Phy	sics (Sem4)
ADVANCED CONDE	NSED MATTER PHYSICS
Subject Cod	e:MSPH-544-18
M.Co	de : 77850
Date of Exami	nation:20-12-2022
Гime:3 Hrs.	Max. Marks:70
NSTRUCTIONS TO CANDIDATES :	

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks 1. each.
- SECTION-B contains SEVEN questions carrying FIVE marks each and students 2. have to attempt any SIX questions.
- SECTION-C contains THREE questions carrying TEN marks each and students 3. have to attempt any TWO questions.

SECTION-A

1. **Answer briefly :**

- a) Define reflectance and transmittance.
- b) What do you understand by Brillouin scattering?
- c) What are the applications of Raman effect?
- d) What is Neel temperature?
- e) Write short note on thermal excitation of Magnons.
- f) What are the applications of nuclear magnetic resonance?
- g) Why superconductivity is a low temperature phenomena?
- h) What is the importance of Cooper pairs in superconductivity?
- i) What do you understand by non-crystalline solids?
- j) What are the applications of quasicrystals?

SECTION-B

- 2. Write a note on inter band transitions in Raman spectroscopy.
- 3. What are phonons and magnons? Discuss their application to spin wave theory.
- 4. What is the principle of nuclear magnetic resonance? Discuss its theory.
- 5. What is Knight shift? Discuss its importance in nuclear magnetic resonance.
- 6. What do you understand by high T_c superconductors? Discuss the applications of these superconductors.
- 7. What are the differences between glasses and amorphous semiconductors?
- 8. Discuss about the heat capacity and thermal conductivity of amorphous solids.

SECTION-C

- 9. What is generalized susceptibility? Explain Kramers-Kronig relations with necessary mathematical treatment.
- 10. What is superconductivity? Discuss Ginzburg-Landau theory in detail.
- 11. What do you understand by diamagnetic substances? Discuss Langevin theory of diamagnetism.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.