G 2778

(Pages : 2)

Reg. No.....

Name.....

M.Sc. DEGREE EXAMINATION, JUNE 2015

Fourth Semester

Faculty of Science

Branch II—Physics

A—Pure Physics

Paper XIV—CONDENSED MATTER PHYSICS—II

(Common with paper XIV of branch IIB non conventional energy)

(Prior to 2012 Admissions)

Time : Three Hours

Maximum : 75 Marks

Section A

Answer any **six** *questions.*
Each carries 2 *marks.*

1. What is meant by structure of a crystal ? Explain.
2. Explain Curie point.
3. List the major applications of thin films.
4. What is super exchange interaction ?
5. Explain DC Josephson effect.
6. What is meant by ultrasonic attenuation ? Explain.
7. Explain the features of superconductivity.
8. What are spin waves in electron gas ?
9. Give the characteristics of polarons.

(6 × 2 = 12 marks)

Section B

Answer any **three** *questions .*
Each carries 5 *marks.*

10. Distinguish between crystals and amorphous materials.
11. Differentiate between ferromagnetic and anti-ferromagnetic materials.
12. Describe the electrical properties of thin films.
13. Write a note on SQUIDS.
14. Describe the concept of spin waves in electron gas.

(3 × 5 = 15 marks)

Turn over

Section C

Answer **all** *questions.*
Each carries 12 *marks.*

15. (a) Discuss on the *two* sub-lattice model for anti-ferromagnetic order.

Or

(b) Give an account on ferromagnetic domain.

16. (a) Discuss the various optical properties of thin films.

Or

(b) Describe the adiabatic demagnetization of a paramagnetic substance with experimental set up.

17. (a) Describe the influence of external agents on superconductivity.

Or

(b) Discuss the Landaus theory for superconductors.

18. (a) Give an account on magnon interactions.

Or

(b) Discuss BCS theory for attractive interaction.

(4 × 12 = 48 marks)