

**45073 (C)**

M.Sc. DEGREE EXAMINATION, MARCH/APRIL 2020.

FOURTH SEMESTER

Physics

Paper III — VACUUM AND THIN FILM PHYSICS

Time : Three hours

Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks.

Each answer should not exceed 1 page.

1. Explain the working of oil sealed Rotary pump.
2. Write the application of vacuum in metallurgy.
3. Write in brief on reactive evaporation method for deposition of metal oxide thin film.
4. Explain in brief about the chemical vapour deposition of thin film.
5. Explain four stages of growth of thin films.
6. Write DC sputtering method for deposition of thin film.
7. Explain how temperature coefficient of resistance varies in metallic thin films?
8. Write in brief on thin film transistor.

PART B — (4 × 15 = 60 marks)

Answer ALL questions.

Each question carries 15 marks.

Each answer should not exceed 6 pages.

9. With diagram explain the construction and working of Turbo molecular pump? What are its limitations?

Or

10. Explain how hot cathode ionization gauge is used to measure high vacuum.

11. Explain the working of laser deposition method for preparation of thin film.

Or

12. Explain in detail on the spray pyrolysis method for deposition of thin films. What are its variants?

13. With neat diagram explain how three source evaporation method is used to deposit ternary thin films.

Or

14. Write in detail on multiple beam interferometer to determine thick of deposited thin films.

15. Explain in detail on beam splitters and reflection and antireflection coatings.

Or

16. Explain how Hall mobility and charge carrier concentration of a semiconducting film can be determined in the laboratory. What are its applications?

