



25802557

QP CODE: 25802557

Reg No :

Name :

INTEGRATED MSC DEGREE EXAMINATION, MAY 2025

Fourth Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

**COMPLEMENTARY - ICH4CM05 - PHYSICS IV - OPTICS, DIELECTRICS AND
SPECTROSCOPIC INSTRUMENTATION**

2020 Admission Onwards

17664900

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What is a wavefront ?
2. What is fringe width ?
3. What is dispersive power of a grating ?
4. What is dispersive power of optical instrument?
5. State Brewster's law.
6. Briefly explain Malus law.
7. Draw the schematic of an optic fibre.
8. Define dielectric constant. What is its unit?
9. Give two properties of visible spectra.
10. What is inelastics scattering?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain young's double slit experiment.
12. Explain the formation of Newton's rings by reflected light.
13. Explain Huygen's explanation of Double refraction in uniaxial crystal.
14. Explain the components involved in Laser.





15. What is pumping? Briefly explain different methods of pumping.
16. A step index fiber has a core of refractive index 1.55 and cladding of refractive index 1.5 Calculate numerical aperture and Acceptance angle of the fiber Assume that launch medium is air
17. What is ferroelectricity? Give an example of ferroelectric crystal.
18. The distance between adjacent atomic planes in a calcite crystal is 0.3nm. Find the smallest angle of bragg scattering for 0.03nm X rays

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain the Phenomenon of interference , also obtain the analytical solution of interference.
20. Explain the principle and working of He-Ne laser. What are its merits compared to Ruby laser?
21. Explain polar and non polar dielectrics also discuss the dielectric polarisation of matter.
22. Explain the working principle of FTIR. What are its applications?

(2×5=10 weightage)

